FIRST AND SECOND LANGUAGE ACQUISITION OF BINDING: AN INVESTIGATION OF KOREAN-SPEAKING CHILDREN AND KOREAN ADULT LEARNERS OF ENGLISH

By

HYE-RYUN KIM

A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

1993

ACKNOWLEDGEMENTS

I would like to express my deep gratitude to Dr. Andrea E. Tyler, my committee chairperson, for her guidance, encouragement and many insightful comments. I am also very grateful to my committee members, Professors Enrique Mallén, Norman N. Markel, Ann K. Wehmeyer and Michael J. Farrar, for their helpful comments and suggestions.

Special thanks go to my former advisors Dr. David Birdsong, who taught me much about second language acquisition, and Dr. John Lipski, who has been a constant source of intellectual stimulation.

I would also like to thank Dr. Jean Casagrande, Director of the Linguistics Program, who has helped me countless times.

Thanks are extended to my fellow graduate students, Beom Yoo, Hye-Ran Lee, Jin-Kyung Kim, Dongying Wu and Marilia Painter, for helpful discussions.

I am especially indebted to my former advisor in Korea, Kyung-ja Park, who has constantly encouraged me to complete this work. Without her help I would not be where I am now.

Thanks are also due to Professors Yong-Jae Lee, Choong-Bae Kim, Duk-Ki Kim, Ok Song, Jong-Ken Kim, Kee-Ho Kim and Young-Beom Park, for their warm encouragement.

Finally, I would like to express my deep appreciation to

my parents, my parents-in-law and my husband, for their never-ending love and support.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS ii

LIST OF TABLES vii

LIST OF FIGURES viii

KEY TO ABBREVIATIONS xi

ABSTRACT xii

CHAPTERS

1 INTRODUCTION 1

- Linguistic Theory and Language Acquisition 3
- The Theory of Universal Grammar 6
- Universal Grammar and First Language Acquisition . 10
  - The Logical Problem of Language Acquisition . 10
  - Core Versus Peripheral Grammars and Markedness 13
  - Problem of Development 15
- Universal Grammar and Second Language Acquisition 18
  - The Logical Problem of Second Language Acquisition 18
  - The Availability of Universal Grammar in Second Language Acquisition 21
- The Subset Principle in First and Second Language Acquisition. 23
- Outline of the Study 27

2 THEORETICAL BACKGROUND 30

- The Binding Theory 30
  - The Standard Binding Theory: Chomsky (1981) . 30
  - Problems in the Standard Binding Theory . . . 37
  - The Revised Binding Theory 42
  - LF-Movement to INFL Theory 45
- Binding Theory in Korean 51
  - Basic Description of Korean Anaphora 51
  - Korean Anaphors and Binding Theory 52
  - Pronominal Binding in Korean 64
- Binding Theory and Language Acquisition 66
  - The Governing Category Parameter and the Proper

Antecedent Parameter 66
The Subset Principle and the Parameters of Binding Theory 68

3 PREVIOUS STUDIES 71

First Language Acquisition of Binding Theory . . . 72
Wexler and Chien (1985) 72
Crain and McKee (1985) 77
Deutsch, Koster and Koster (1986) 78
Kaufman (1988) 81
Grimshaw and Rosen (1990) 84
McDaniel, Cairns and Hsu (1990) 86
Hyams and Sigurjónsdóttir (1990) 89
Lee (1990) 91
Summary 94
Second Language Acquisition of Reflexive Binding . 95
Finer and Broselow (1986) 95
Thomas (1989) 97
Hirakawa (1990) 100
Summary 103

4 KOREAN CHILDREN'S ACQUISITION OF BINDING 105

Choosing a Task 106
The Acquisition of Binding Principles 107
Method 107
Experiment for Principle A 109
Experiment for Principle B 127
Experiment for Principle C 142
Discussion 158
The Acquisition of the Long-Distance Reflexive caki 171
The Experimental Hypotheses 171
Method 172
Results 177
Discussion 180

5 SECOND LANGUAGE ACQUISITION OF ENGLISH REFLEXIVES BY NATIVE SPEAKERS OF KOREAN 185

Rationale 185
The Experimental Hypotheses 187
The Experiment 189
Method 189
Results 194
Discussion 206
Implications of the Results of the Experiment for Second Language Pedagogy 208

6 SUMMARY AND CONCLUSIONS 211

APPENDICES

A PRETEST SENTENCES (I) 214

B PRETEST SENTENCES (II) 215

C FILLER SENTENCES 216

D PRETEST FOR SECOND LANGUAGE LEARNERS 219

REFERENCE LIST 220

BIOGRAPHICAL SKETCH 228

LIST OF TABLES

Table 1 Mean Percentage Correct on Truth Value Judgment Task 83

Table 2 The Percentage of Responses in Tensed and Infinitive Clauses 96

Table 3 Mean Percentages of Responses in Bi-clausal Finite Sentences: Coreference Neutral . . . 100

Table 4 Mean Percentages of Responses in Two Types of Clauses 102

Table 5 Responses from the Control Groups 195

Table 6 The Number and Percentage of Responses by Experimental Groups 197

Table 7 The Number of Subjects within Each Group Who Systematically Bound Reflexives to the Indicated Antecedent(s) 200

Table 8 Mean Number and Percentage of Correct Responses (by Groups) 201

Table 9 The Number of Responses to (5) by Groups . . . 205

LIST OF FIGURES

Figure 1 The Model of UG 8

Figure 2 The Subset Relation 23

Figure 3 The Governing Category Parameter 69

Figure 4 The Proper Antecedent Parameter 69

Figure 5 (1a) The Match Condition 112

Figure 6 (1a) The Mismatch Condition 112

Figure 7 (1b) The Match Condition. 113

Figure 8 (1b) The Mismatch Condition 113

Figure 9 (1c) The Match Condition 114

Figure 10 (1c) The Mismatch Condition 114

Figure 11 (1d) The Match Condition 115

Figure 12 (1d) The Mismatch Condition 115

Figure 13 (1e) The Match Condition 116

Figure 14 (1e) The Mismatch Condition 116

Figure 15 (1f) The Match Condition 117

Figure 16 (1f) The Mismatch Condition 117

Figure 17 Percentage of Correct Responses to (1a) . . 120

Figure 18 Percentage of Correct Responses to (1b) . . 121

Figure 19 Percentage of Correct Responses to (1c) . . 122

Figure 20 Percentage of Correct Responses to (1d) . . 123

Figure 21 Percentage of Correct Responses to (1e) . . 124

Figure 22 Percentage of Correct Responses to (1f) . . 125

Figure 23 (3a) The Match Condition 130

Figure 24 (3a) The Mismatch Condition 130

Figure 25 (3b) The Match Condition 131

Figure 26 (3b) The Mismatch Condition 131

Figure 27 (3c) The Match Condition 132

Figure 28 (3c) The Mismatch Condition 132

Figure 29 (3d) The Match Condition 133

Figure 30 (3d) The Mismatch Condition 133

Figure 31 (3e) The Match Condition 134

Figure 32 (3e) The Mismatch Condition 134

Figure 33 (3f) The Match Condition 135

Figure 34 (3f) The Mismatch Condition 135

Figure 35 Percentage of Correct Responses to (3a) and (3b) 137

Figure 36 Percentage of Correct Responses to (3c) and (3d) 138

Figure 37 Percentage of Correct Responses to (3e) and (3f) 139

Figure 38 (4a) The Match Condition 145

Figure 39 (4a) The Mismatch Condition 145

Figure 40 (4b) The Match Condition 146

Figure 41 (4b) The Mismatch Condition 146

Figure 42 (4c) The Match Condition 147

Figure 43 (4c) The Mismatch Condition 147

Figure 44 (4d) External Reference 148

Figure 45 (4d) Backwards Coreference 148

Figure 46 (4e) External Reference 149

Figure 47 (4e) Backwards Coreference 149

Figure 48 Percentage of Correct Responses to (4a) . . . 151

Figure 49 Percentage of Correct Responses to (4b) . . . 152

Figure 50 Percentage of Correct Responses to (4c) . . . 153

Figure 51 Percentage of 'Yes' Responses to (4d) 154

Figure 52 Percentage of 'Yes' Responses to (4e) 155

Figure 53 Percentages of Correct Responses to Reflexives (caki), Pronouns and R-expressions: The Match Condition 159

Figure 54 Percentages of Correct Responses to Reflexives (caki), Pronouns and R-expressions: The Mismatch Condition 160

Figure 55 Percentages of Correct Responses to Principles A, B and C: The Match Condition 162

Figure 56 Percentages of Correct Responses to Principles A, B and C: The Mismatch Condition 163

Figure 57 An Outline of Processing Stages 168

Figure 58 (5a) Local Binding 175

Figure 59 (5a) Long-Distance Binding 175

Figure 60 (5b) Local Binding 176

Figure 61 (5b) Long-Distance Binding 176

Figure 62 Percentage of 'Yes' Responses to (5a) 178

Figure 63 Percentage of 'Yes' Responses to (5b) 179

Figure 64 Relationship of Score to Number of Years of English Study 203

KEY TO ABBREVIATIONS

ACC: Accusative

COMP: Complementizer

DAT: Dative

DEC: Declarative

GEN: Genetive

ING: Progressive

LOC: Locative

NOM: Nominative

TOP: Topic Marker

Q: Question Marker

Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Philosophy

FIRST AND SECOND LANGUAGE ACQUISITION OF BINDING: AN INVESTIGATION OF KOREAN-SPEAKING CHILDREN AND KOREAN ADULT LEARNERS OF ENGLISH

By

Hye-Ryun Kim

DECEMBER 1993

Chairperson: Andrea E. Tyler
Major Department: Linguistics

Within the Universal Grammar (UG) framework language acquisition is seen as an essentially deductive process in which the child analyzes input on the basis of a biologically determined set of principles. Knowledge of binding principles is a good candidate as a speaker's innate endowment since it is underdetermined by input.

The purpose of this dissertation is to provide a unified account of acquisition of binding conditions by examining both first and second language acquisition of binding.

The first part of this dissertation reports on four experiments involving Korean children's acquisition of binding. The first three experiments investigate Korean children's knowledge of the binding principles A, B and C, respectively. The fourth experiment examines the Subset Principle effect in the acquisition of the long-distance anaphor caki in Korean. The results of the first three experiments suggest that Principle B is not necessarily less available to children early in their grammatical development than Principle A. The children performed very well on the reflexive caki. However, with respect to another type of reflexive cakicasin and the reciprocal selo, they showed poor performance. The children also showed difficulties with Principles B and C. A steady increase in performance from younger to older children was found in all three experiments. These findings strongly support the Lexical Learning Hypothesis. The results of the fourth experiment suggest that the Subset Principle operates in Korean children's acquisition of long-distance binding.

One of the central issues in second language acquisition research concerns the question of whether UG is accessible to adult second language learners. With respect to this issue, the second part of this dissertation investigates how Korean adult learners of English interpret English reflexives. The results of this experiment showed that Korean learners allowed the nonlocal antecedent about 35% of the time, which suggests that the Subset Principle does not operate in second language acquisition. The most advanced learners showed no performance difference from native speakers of English. This finding suggests that parameter resetting to the L2 value is possible. This dissertation concludes that both first and second language acquisition are constrained by UG.

CHAPTER 1
INTRODUCTION

Binding theory is a subsystem of Universal Grammar (UG) whose principles characterize and constrain relations of anaphors, pronouns, names and variables to possible antecedents (Chomsky 1981). The study of anaphoric relationship has been a central topic of investigation in current linguistic theory since it directly addresses the logical problem of language acquisition. As pointed out by Wasow (1986), anaphoric elements are a part of all natural languages, so any theory that aims to characterize speakers' linguistic abilities must address this issue. In addition, the rules that govern the interpretation of anaphoric elements are claimed to be a part of a speaker's innate endowment because the knowledge of the binding relations is one of the properties of language underdetermined by the input. Therefore, demonstrations of children's knowledge of the binding principles will provide evidence for the theory of UG.

The theory of UG has emphasized the syntactic similarity of languages on the basis of the assumption that the principles of UG do not vary from language to language. However, since languages show certain variations, parameters have been introduced into the theory of UG as a means of explaining these syntactic variations. As a result, within the principles and parameters framework, research on cross-linguistic variation has been important. Cross-linguistic variation of binding domains within the binding theory may be one of the most widely studied topics over the last decade. The fact that Korean reflexives allow long-distance antecedents as well as local ones, whereas English reflexives allow only local antecedents raises interesting research questions for language acquisition. The question arises as to how Korean-speaking children and Korean adult learners of English come to set and reset, respectively, the parameters of the binding theory. In particular, the question arises as to whether the Subset Principle as a learning principle operates in L1 acquisition and, if it does, whether it also functions in L2 acquisition.

The purpose of this dissertation is to provide a unified account of acquisition of binding conditions by examining both Korean-speaking children's acquisition of binding and Korean adult learners' second language acquisition of English reflexive binding. It will be argued that both L1 and L2 acquisition are constrained by UG. In terms of first language acquisition, this study aims to contribute to our better understanding of the interactive process between the innate principles of UG and the data of the child's linguistic environment. In terms of second language acquisition, this study intends to provide information pertaining to the question of UG accessibility in L2 acquisition by addressing the issue of the possibility of parameter resetting to the L2 value.

This introductory chapter characterizes the theory of UG which motivates this study. The entailments of this theory on first and second language acquisition will be also discussed. Finally, the Subset Principle as one of the learning principles which are independent of but interact with principles and parameters of UG will be described.

Linguistic Theory and Language Acquisition

During the last thirty years, the study of language has been conducted within the framework of generative grammar, a research program inspired by Chomsky (1957, 1965). Chomsky's theory introduced the idea that language should be seen as the output of a productive system of rules, a grammar internalized by a native speaker, which would allow for creative and novel utterances. Since then, it has been the acknowledged aim of generative grammar to discover a grammar which is not merely a description of a language but which accounts for the ideal speaker-hearer's knowledge of his language. A grammar that achieves this goal is said to be "descriptively adequate."

The question of what adult native speakers unconsciously know is not separated from that of how native speakers of a language come to possess the knowledge of their language.

According to Chomsky (1965, 1981), linguistic theory and language acquisition are necessarily linked. Chomsky argues that a theory that selects the best available descriptively adequate grammar for a given language on the basis of primary linguistic data achieves "explanatory adequacy", the most ambitious level of theoretical adequacy. Thus, in order to achieve explanatory adequacy, a linguistic theory must be able to offer an explanation of how first language (L1) acquisition is possible. Within the Government-Binding (GB) theory of grammar (Chomsky 1981, 1982), the framework presupposed in this dissertation, it is assumed that the child is innately endowed with Universal Grammar (UG) which consists of a number of principles that restrict the class of possible grammars and constrain their form.

While there has been a close connection between linguistic theory and first language acquisition research, relatively few attempts have been made to relate second language (L2) acquisition research to theoretical linguistics. Recently, however, applications of generative theory to the study of second language acquisition have been seriously considered. This is seen in work by Bley-Vroman (1989), Clahsen and Muysken (1986), Felix (1985), Flynn (1987) and White (1985).

The guiding assumption is that if principles of UG do in fact characterize a language faculty that is biologically determined and that is necessary for the acquisition of a first language, then it is quite reasonable to assume that principles of UG also play a role in second language acquisition. There has been much debate over the question of whether UG is still available in second language acquisition. One position is that first and second language acquisition are identical with respect to the operation of UG. Another position is that UG is totally unavailable to adult second language learners (Clahsen and Muysken 1986; Schachter 1988). A third position, which is more moderate, is that UG is unavailable but any aspects of it encoded in the L1 can be used in the L2 (Bley-Vroman, 1989). A fourth position is that UG is still available for adult second language learners but principles and parameter settings from the L1 are initially used as an interim way of dealing with the L2 data (Flynn, 1987; White 1988).

The relationship between linguistic theory and acquisition research is bidirectional and mutually beneficial. "The theory will guide and constrain the hypotheses that the research is willing to entertain and test in considering both the course of language development and the ultimate knowledge to be attained. Conversely, particular language acquisition studies will provide empirical evidence for or against specific theoretical models" (Gass and Schachter 1989, p. 1). Generative grammar provides acquisition research with a testable model by proposing particular principles and parameters which in turn generate a constraining set of predictions. Conversely, first language acquisition research provides evidence for or against UG, and second language acquisition research informs us whether UG continues to function in adult second language acquisition.

The Theory of Universal Grammar

During the course of development of generative grammar, the ultimate goal itself has changed little--the search for explanatorily adequate characterizations of the properties of natural languages. However, as research advances, there has been a considerable shift in emphasis away from the precise characterization of language-particular, construction-specific rule-systems and towards a search for general interacting principles from which the complex properties of individual languages follow as consequences (Freidin, 1991). Principles that hold of all human languages are said to be part of Universal Grammar (UG). In Chomsky's view, UG is a genetic endowment: we human beings are born equipped with a set of universal linguistic principles. Chomsky's theory of UG, then, may be thought of as a theory of how it comes about that the native speakers of a given language come to share a highly abstract body of knowledge despite great variations in their linguistic experience (Horrocks 1987). Chomsky argues that the correct theory of the initial state will be rich enough to account for the attainment of a specific language on the basis of the evidence available to the child, but not so rich as to exclude attainable languages. By incorporating a limited number of parametric options into UG, an account of linguistic variation is provided under the theory of UG.

One of the most well developed formulations of a principles and parameters approach to UG is Government-Binding (GB) theory. Within this framework, UG is seen as consisting of interacting subsystems, which can be considered from two perspectives. First, it can be viewed as a system of rules, made up of subcomponents that generate several levels of grammatical representations. Second, it can be viewed as a system of principles, made up of subsystems that hold of rules, constraining representations of various sorts.

The rule system consists of three basic parts (Chomsky 1982, p. 4):

(1) a. Lexicon
    b. Syntax: (i) Base component
               (ii) Transformational component
    c. Interpretive components: (i) PF component
                                (ii) LF component

The lexicon specifies the inherent properties of lexical items. The rules of the base component generate D-structures, which are representations of the grammatical functions that are associated with θ-roles. The rules of the transformational component assign to each D-structure an associated S-structure. The relations encoded at D-structure continue to be represented at S-structure through the medium of traces left by the movement rules ("move-α"). S-structures feed the two other representational levels of the grammar, the PF and the LF which are grammatical representations of aspects of the sound and the meaning, respectively.

Thus, the model of UG proposed within GB framework is represented as in figure 1:

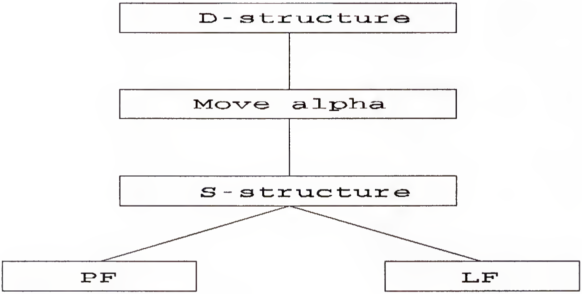


Figure 1 The model of UG

The subsystems of principles include the following:

(2) a. X-bar theory

b. θ-theory

c. Case theory
d. Binding theory
e. Bounding theory
f. Control theory
g. Government theory

X-bar theory provides the basic structure of all phrases and clauses. It lays the structural foundation in terms of which relations such as "dominate", "immediately dominate", "c-command", and "government" are defined.

θ-theory is concerned with the assignment of thematic roles such as "agent", "goal", "theme", etc. to the argument positions in a given syntactic structure.

Case theory deals with the assignment of abstract Case and its morphological realization. An important part of Case theory is the "Case Filter" which states that every lexical NP must have Case.

Binding theory deals with the relationship of anaphors, pronominals, and R-expressions (names and variables) to their possible antecedents.

Bounding theory specifies locality conditions, in particular, the "Subjacency Condition" on movement rules.

Control theory is concerned with the interpretation of PRO, the phonetically null NP in such constructions as 'I tried [[PRO to leave]]'.

Government theory deals with the relation holding between the head of a construction and the categories that depend on it.

These systems of principles interact in a variety of ways, and it is assumed that these principles work in some way for all grammars. That is, they are universal. However, languages may differ as to certain "parameters". UG captures the variation between languages in terms of a limited choice between two or so possibilities, known as parameters. For example, the head parameter admits a limited range of alternatives: "head-final" (e.g. Korean) or "head-initial" (e.g. English).

Universal Grammar and First Language Acquisition

The Logical Problem of Language Acquisition

It has been argued that the linguistic data to which children are exposed appear to be too poor to determine all aspects of the mature capacities that they eventually attain. The gap between available experience and eventual knowledge has been called the "logical problem of language acquisition" (Hornstein and Lightfoot, 1981). Since Baker (1979) first discussed this issue extensively, the problem of learnability has drawn much attention in theoretical linguistics. This issue is addressed by Chomsky as "Plato's Problem": "How do we come to have such rich and specific knowledge, or such intricate systems of belief and understanding, when the evidence available to us is so meager?" (Chomsky 1987, p. 7). Chomsky argues that native speakers of a language possess subtle and complex linguistic knowledge which goes far beyond the input. For example, how do native speakers of English know that examplars of the type *'Who did John make the claim that he saw last week?' are ungrammatical if there is no explicit evidence for their ungrammaticality available in the linguistic input to them?

Those who take the learnability approach to language acquisition (Pinker, 1984, 1989; Wexler and Culicover, 1980; Hyams, 1986; Roeper and Williams, 1987)[1] argue that if the child comes to the acquisition task equipped solely with some general learning mechanism extracting regularities from the data he or she is exposed to, it would seem impossible to arrive at the correct generalizations without innumerable errors which have not been attested in child language. For example, English-speaking children never make yes-no questions like "*Is the man who tall is John?" This fact suggests that children seem to follow structure-dependent syntactic rules from the onset. Learnability theorists also assume that children are never informed about the distinction between grammatical and ungrammatical sentences and thus they do not depend on negative evidence to reject incorrect hypothesis. Brown and Hanlon's (1970) study provides supportive evidence. Brown and Hanlon found that parents did not differentially express approval or disapproval contingent on whether the child's prior utterance was well-formed; nor did parents understand well-formed questions better than ill-formed ones.

---

[1] In this dissertation, I assume that there is no genuine difference between Chomsky (1981, 1986a) and learnability theorists in view of child language acquisition, although some people (Atkinson, 1987) insist on a difference between two.

To solve Plato's problem - accounting for the richness, complexity, and specificity of shared knowledge, given the limitations of the data available - UG theory claims that "our knowledge of ungrammaticality in particular, and our ability to extract linguistic regularities from positive evidence generally, are accounted for by an innate cognitive faculty specific to the task of acquiring natural languages" (Birdsong, 1989, p.90). This faculty is called UG. According to Chomsky (1986a), UG is

> a characterization of the genetically determined language faculty. One may think of this faculty as a "language acquisition device," an innate component of the human mind that yields a particular language through interaction with presented experience, a device that converts experience into a system of knowledge attained: knowledge of one or another language. (p. 3)

UG consists of principles which predispose the child to organize language in certain ways, leading to rather limited possibilities for grammar construction instead of the full range that would be logically allowed if language learning consisted only of applying general inductive learning strategies or problem solving procedures (White, 1990). In addition to fixed principles, UG contains parameters, with parameter settings that differ from language to language. The parameters in the child's mind can be thought of as built-in switches, each to be turned to suit the language that is heard (Cook, 1988). For example, languages differ in the position of heads within phrases: English is head-initial, whereas Korean is head-final. To acquire English or Korean, the child must determine how the switch for the head parameter is set from the positive evidence. In Chomsky's view, acquiring a language means setting all UG parameters. Chomsky (1987) articulates his idea on language acquisition as follows:

> The initial state of the language faculty consists of a collection of subsystems, or modules as they are called, each of which is based on certain very general principles. Each of these principles admits of a certain very limited possibility of variation. We may think of the system as a complex network, associated with a switch box that contains a finite number of switches. The network is invariant, but each switch can be in one of two positions, on or off. . . . when the switches are set in one of the permissible ways, the system functions, yielding the entire infinite array of interpretation for linguistic interpretation. A slight change in switch settings can yield complex and varied phenomenal consequences as its effects filter through the network. . . . To acquire a language, the child's mind must determine how the switches are set, and simple data must suffice to determine the switch setting,. . . . (p. 15)

Core versus Peripheral Grammars and Markedness

UG theory maintains a distinction between "core" and "peripheral" grammar. Core grammar refers to those parts of the language determined by fixing values for the parameters of UG. "The periphery is whatever is added on in the system actually represented in the mind/brain of a speaker-hearer" (Chomsky 1986a, p. 147). The periphery includes aspects that are not predictable from UG. For instance, the idiosyncracies of the auxiliary system in English represent a peripheral aspect. The theory of UG does not intend to account for the whole of linguistic knowledge, only the core.

The distinction between core and periphery is related to the notion of markedness. In the theory of UG, it is assumed that the rules of the core grammar are unmarked and those of the peripheral grammar are marked. The theory predicts that as soon as the linguistic input triggers a learner's awareness of the existence of a core or unmarked rule in the grammar, the rule not only would be learned easily, but it would be learned on the basis of minimal exposure to that language because it is predicted on a principle of UG. In the case of peripheral or marked rules, the prediction is that they would have to be learned on the basis of positive evidence of their existence in the grammar. Hence their instantiation in a grammar takes longer to learn than a related unmarked rule.

Another sense of markedness in UG refers to the choice between settings for a parameter. For example, in the case of the "pro-drop" parameter, the question of deciding which is the initial setting, i.e., whether the initial setting is "+ pro-drop" or "- pro-drop" becomes one of determining which setting is unmarked. If the pro-drop is considered unmarked, as argued by Hyams (1986), and thus the switch is initially set to pro-drop, children learning Italian have nothing to learn but those learning English need to learn something to move the switch from the unmarked to the marked setting (Italian is a pro-drop language, whereas English is a non-pro-drop language). Chomsky (1981) summarizes the theory of markedness in relation to UG as follows.

> In our idealized - but not unrealistic - theory of language acquisition, we assume that the child approaches the task equipped with UG and an associated theory of markedness that serves two functions: it imposes a preference structure on the parameter of UG, and it permits the extension of core grammar to a marked periphery. Experience is necessary to fix the values of parameters of core grammar. In the absence of evidence to the contrary, unmarked options are selected. (p. 8)

Problem of Development

In recent years the problem of development, i.e., why the course of linguistic development takes the form that it actually does, has been a matter of debate in learnability theory. With regard to the problem of learnability, it is generally accepted in learnability theory that the child is equipped with a set of innate formal principles called UG, which allow him or her to attain the grammar of a particular language on the basis of positive data available from the input. However, with regard to the problem of development several different ways of dealing with this problem have been offered:

(3) a. The Continuity Hypothesis
    b. The Maturation Hypothesis: (i) the strong version
                                  (ii) the weak version

The Continuity Hypothesis (CH) claims that all of the innately specified principles for language acquisition are present at all stages of first language development, even at the earliest stages. Under this view, the problem of development is solved in terms of the lexical learning hypothesis and perceptual mechanisms. The basic idea is that during the developmental process the child's perception of the input data changes, so that he or she is forced to restructure his or her grammar in order to accomodate these newly perceived data. Increase in the child's lexicon also affects restructurings of his or her grammar. Those who support this view (Pinker 1984, Hyams 1986, Clahsen 1992) claim that every theory of acquisition has to acknowledge that the child's memory size and general processing capacities increase over time.

The Maturation Hypothesis (MH) assumes a maturational schedule as part of the child's genetic code, according to which UG principles successively emerge during language development. Both versions of the MH definitely hypothesize that the principles are not learned, that is, the principles do not depend on the child's obtaining evidence for their development. Rather, the principles mature like any other instance of biological maturation (Borer & Wexler 1987). The strong version of the MH (Felix 1987) claims that the principles of UG are themselves subject to an innately specified developmental process. They lie latent until the moment for their activation arrives. At that point, the child restructures the grammar to accomodate a new principle that the existing grammar violates in some way. The weak version of the MH claims that innate knowledge of grammatical principles is not evident at some early stage because certain structures are not yet matured.[2] Under the MH, the maturational schedule contributes the essential solution to the developmental problem. Borer and Wexler (1987) claim that the MH is favored empirically over the CH by cases in which a child maintains for a period of time either a non-optimal grammar or a grammar clearly falsified by simple data. The two variants of the MH differ with respect to the question of whether intermediate grammars are consistent with UG or not. The strong version assumes that at early developmental stages child grammars permit structures that violate principles of UG, whereas the weak version assumes that during development, the grammar of the child permits structures that are impossible or only marginally possible in the target language but are possible structures in other languages, that is, that obey principles of UG.

---

[2] An example is the growth of A-chains (Borer and Wexler, 1987). Borer and Wexler argue that premature children have problems in dealing with verbal passives because access to A-chains and θ-role assignment to such chains are developed relatively late.

With respect to these alternatives as possible solutions to the problem of development, Chomsky does not deny any of them. He admits that either "growth theory" or "no growth theory", in his terms, can be a candidate for an explanation (Chomsky 1987). Since the theory of UG treats acquisition as an "instantaneous" process, that is, it assumes that language acquisition occurs in an instant, only two states of the language development--the initial state S_0 and the steady state S_s--are considered. However, in actual language acquisition process, this idealization is not maintained. The child encounters difficulties in coping with the primary linguistic data and so developmental delay is observed. Therefore, how to account for developmental sequences is also an important issue.

Universal Grammar and Second Language Acquisition

The Logical Problem of Second Language Acquisition

In the field of second language acquisition research, it has been suggested that adult second language learners as well as first language learners are faced with what has been called the logical problem of language acquisition. As discussed in the previous section, native speakers end up with a complex grammar that goes far beyond the input. The same issue may be considered for second language acquisition. If second language learners attain highly sophisticated and complex linguistic properties which are not immediately obvious in the input data and which are not explicitly taught in the classroom, then we may assume that there is indeed a logical problem of second language acquisition. Recent studies (Bley-Vroman, Felix and Ioup, 1988; Finer and Broselow 1986) have shown that successful second language learners observe principles like Subjacency, the Empty Category Principle, and the Binding Theory. White (1989b, 1990) argues that the logical problem of second language acquisition cannot be solved without assuming that UG plays a role in second language acquisition. Her claim is that the second language learner may use principles and parameter settings from the first language, initially, to deal with the second language data, but that parameter resetting to the second language value is possible, given appropriate second language input interacting with a still active UG (1990, p. 127). In contrast to White, Bley-Vroman (1989) provides a different formulation of the logical problem of second language acquisition.[3] Bley-Vroman claims that although the logical problem of adult second language acquisition is the same as for childhood language acquisition, the problem is also different in important ways. According to him, adult second language learning differs in "degree of success, in the character and uniformity of the resulting systems, in its susceptibility to factors such as motivation, and in the previous state of the organism: The learner already has a knowledge of one language and a powerful system of general abstract problem solving skills" (1989, p. 41). For Bley-Vroman, then, the logical problem of second language acquisition becomes that of explaining the high level of competence found in successful second language learners, while permitting the wide range of variation also observed. To account for this, Bley-Vroman proposes "the Fundamental Difference Hypothesis", according to which first language acquisition and second language acquisition are fundamentally different. The differences given by Bley-Vroman are as follows: (1989, p. 51)

---

[3] Bley-Vroman (1989) uses the term "foreign language learning" instead of "second language acquisition." However, he states that two terms may be used interchangeably.

First language Acquisition	Second language acquisition
a. Universal grammar	a. Native language knowledge
b. Domain-specific learning procedures	b. General problem-solving systems

Bley-Vroman argues that the child's knowledge of UG and the domain-specific language acquisition device are filled in adults by their native language knowledge and by a general abstract problem-solving system. Since the indirect knowledge of UG possible through the native language is incomplete and accidental, and since there is substantial variation among L2 learners in the general problem-solving ability to deal with abstract formal systems, one may expect lack of perfect success and considerable variation - variation in degree of attainment, in course of learning, and in strategies of learning- in adult second language acquisition.

The Availability of UG in Second Language Acquisition

There has been a considerable amount of research on the question of whether or not UG is accessible to adult second language learners. Four discernible positions have been identified in the literature. These are as follows:

1. UG works in exactly the same way as in L1 acquisition: this position holds that the processes of second language acquisition are essentially those of first language acquisition. The main argument is that since L2 learners possess the kind of complex and subtle linguistic knowledge which is not explicit in the input, UG must still be involved. Therefore, this position assumes that there is no effect from the mother tongue and that UG works exactly as it does in L1 acquisition. In terms of parameter setting, it is predicted that L2 learners will start out with the most restricted parameter setting for every parameter and change the setting only on the basis of positive evidence from the L2 input.
2. UG grammatical principles are totally unavailable to adult L2 learners (Clahsen and Muysken 1986; Schachter 1988):

proponents of this position assume that mechanisms underlying adult L2 acquisition are radically different from those underlying L1 acquisition. It is argued that adult L2 learners no longer have access to UG and that their L2 acquisition is mediated by various general learning strategies which are not unique to language. Since UG is totally unavailable, the question of how the parameters get reset is irrelevant.

3. UG is unavailable but any aspects of it encoded in the L1 can be used in the L2 (Bley-Vroman 1989; Clahsen and Muysken 1989): this view assumes that UG does not play an active role in L2 acquisition but principles and parameter settings exemplified in the L1 are accessible to the adult L2 learners. Thus, in this view, parameter resetting in cases where the L1 and L2 have different values for some parameter will be impossible.

4. UG is still available for adult second language learners but principles and parameter settings from the L1 are initially used as an interim way of dealing with the L2 data (Flynn 1987; White 1988): like the third position, this view assumes that the role of L1 is important, at least initially. However, since UG is still accessible to adult L2 learners, parameter resetting to the L2 value is possible, given appropriate input. In terms of the L2 acquisition process, it is predicted that L2 learners will initially adopt the L1 parameter value for some parameter to deal with L2 input data and then eventually reset it to the L2 value.

The Subset Principle in L1 and L2 Acquisition

Those who take the learnability approach to language acquisition within the theory of UG assume that children never get explicit negative evidence, i.e., evidence about which word strings are ungrammatical, in their language learning environment. However, as pointed out by Gold (1967), there are cases in which languages can not be learned from positive instances only: the cases where there are an infinite number of languages nested by the subset relation. In these cases, positive evidence alone can not distinguish among the infinite number of languages that contain the entire input sample. As an example, consider the following:

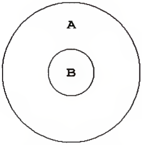


Figure 2 The Subset Relation

In figure 2, the grammar that generates the sentences A also generates the sentences B. A is a superset of B and B is a subset of A. In this case, if the child learning a grammar generating the sentences B but not A entertains a grammar generating the sentences A, this will end up with overgeneralizations. Since a grammar generating the sentences A also generates the sentences B, no amount of positive evidence can falsify the wrong hypothesis. To disconfirm the wrong hypothesis what he or she needs is negative evidence.

Recently, the application of the "no-negative-evidence" (Roeper and Williams, 1987) hypothesis to a parameterized model of grammar was made. If there are cases where languages can not be learned only from positive instances of sentences, and children are not provided with negative evidence, as claimed by learnability theorists, it is necessary to assume that acquisition of linguistic knowledge is mediated by innately-given constraints because virtually all children acquire language. Berwick (1986) supplies a formalization of an innate principle for hypothesis-formation in terms of sets and subsets, and this formalization is taken up by Wexler and Manzini (1987). This principle is called the "Subset Principle". The Subset Principle states that given two languages, one of which is a subset of the other, if both are compatible with the input data, the learning function must pick the smaller one:

(4) The Subset Principle (Wexler and Manzini, 1987, p. 61)

The learning function maps the input data to that value of a parameter which generates a language:

(a) compatible with the input data; and

(b) smallest among the languages compatible with the input data.

In order for the Subset Principle to determine a strictly ordered learning hierarchy, it is necessary that two values of a parameter in fact yield languages which are in a subset relation to each other (i.e., one is a subset of the other). This requirement is what Wexler and Manzini call the "Subset Condition." In other words, it is necessary for the Subset Condition to hold in order for the Subset Principle to apply (Wexler and Manzini 1987). As empirical evidence in favor of the Subset Condition, Wexler and Manzini provide the governing category parameter in binding theory (This will be discussed in Chapter 2 in detail). In conclusion, the Subset Principle, a learning principle, can be considered as a fundamental principle of learnability proposed to guarantee learning without negative evidence in the cases in which languages fall into a subset relation.

Wexler and Manzini further propose that the subset relations between the languages generated under the different values of a parameter be translated into a markedness hierarchy. They argue that the parameter setting or grammar yielding the subset language is the unmarked and grammars yielding supersets are marked. The parameter value that generates the smallest language, i.e., the unmarked value, is what is initially assumed by children in the language learning process, regardless of the target language they are learning. This value is revised only if disconfirming positive evidence occurs. One of the main arguments in Wexler & Manzini (1987) is that markedness hierarchies are not built into UG but rather are derived from the interaction of UG and an autonomous learning component, the essence of which is the Subset Principle.

Chomsky (1986a) also acknowledges the importance of the Subset Principle in the parameter setting process. According to Chomsky, language learning is a matter of setting the parameters, in his terms, setting the switches. Chomsky claims that the Subset Principle as a general principle that determines how the switches are set is a necessary and sufficient condition for learning from positive evidence only, insofar as parameters are independent.

If the Subset Principle is a learning principle which helps the child set the parameters correctly without overgeneralizations, it can be asked whether it also operates in adult L2 acquisition process. In relation to this, three possibilities have been considered.

1. The Subset Principle also operates in L2 acquisition: in this case the prediction is that L2 learners will start out with the most restrictive value of a parameter.
2. The Subset Principle is not operative in L2 acquisition and

L2 learners will transfer their L1 values (White, 1989a; Zobl, 1988; Hirakawa, 1990): in case the L1 value of a parameter is the superset of the L2 value of that parameter, the prediction is that L2 learners will start out with the L1 parameter value which is inappropriate for the L2, resulting in overgeneralizations.

3. Neither the Subset Principle nor L1 transfer occurs (Finer and Broselow, 1986): in case that there are more than two values of a parameter as in the Governing Category Parameter, it is predicted that L2 learners will adopt a parameter value which is neither the value predicted by the Subset Principle nor the L1 value but which is permitted by UG.

Outline of the Study

This first chapter has introduced the theory of UG and discussed what this theory entails for first and second language acquisition. The organization of the rest of this dissertation is as follows.

Chapter 2 provides theoretical motivation for the experiments. The binding theory is described in detail. In doing this, similarities and differences between English and Korean are discussed. In particular, Wexler and Manzini's (1987) proposal concerning the parameterized binding theory and the Subset Principle is reviewed.

Chapter 3 reviews previous studies that were designed to test children's knowledge of the binding principles. A review of previous studies on second language acquisition of English reflexives by non-native speakers is also presented.

Chapter 4 describes four experiments on Korean-speaking children's acquisition of binding. The first three experiments investigate Korean children's knowledge of the binding principles A, B and C, respectively. The fourth experiment examines the Subset Principle effect in the acquisition of the long-distance anaphor caki in Korean. The results of the first three experiments fail to support the notion that Principle B develops later than Principle A. While Korean children performed very well on the reflexive caki, they showed poor performance on another type of reflexive cakicasin and the reciprocal selo. The children also showed difficulties with Principles B and C. A steady increase in performance from younger to older children was found in all three experiments. These findings strongly support the Lexical Learning Hypothesis. The results from the fourth experiment suggest that the Subset Principle operates in Korean children's acquisition of long-distance binding.

Chapter 5 presents another experimental study that was conducted to examine Korean speakers' interpretation of English reflexives. The issues of whether UG is still available to adult second language learners and whether the Subset Principle operates in second language acquisition are discussed. The results of the experiment suggest that the

Subset Principle does not operate in second language acquisition. The experimental data, however, support the claim that parameter resetting to the L2 value is possible since UG is still accessible to adult L2 learners.

Chapter 6 presents summary and conclusions of this dissertation. The implications of this research for first and second language acquisition research and for a theory of UG are discussed. It is argued that both first and second language acquisition are constrained by UG.

CHAPTER 2
THEORETICAL BACKGROUND

This chapter outlines the history of the development of the binding theory. Similarities and differences between English and Korean, and their implications for first and second language acquisition will be discussed. In particular, the parameterized binding theory proposed by Wexler and Manzini (1987) will be examined with respect to the Subset Principle.

The Binding Theory

The Standard Binding Theory: Chomsky (1981)

In "On Binding" (1980), Chomsky formulated the two conditions in (1) and (2) as principles of binding.

(1) Specified Subject Condition (SSC)

If α is in the domain of the subject β, β minimal, then α cannot be free in β.

(2) Nominative Island Condition (NIC)[1]

---

[1] The Nominative Island Condition is a revised formulation of the Tensed-S Condition (TSC). The Tensed-S Condition was first proposed in Chomsky (1973), together with the Specified Subject Condition. Chomsky (1980), noticing the redundancy in the TSC and SSC, proposed the NIC to restrict the TSC's

A nominative anaphor in S cannot be free in S′.

These two conditions defined opaque domains. Consider the following examples:

(3) a.*John$_i$ saw [$_{NP}$ Mary's pictures of himself$_i$].

b.*John$_i$ believes [$_{S'}$ that [$_S$ himself$_i$ is a genius]].

(3a) is ruled out since the reflexive is in the domain of the subject Mary and is free in the minimal domain NP. (3b) is ungrammatical because the nominative reflexive himself is not bound within the minimal finite clause containing it.

In Lectures on Government and Binding (1981), Chomsky argued that while the binding theory of "On Binding" had many good consequenses, there were still a number of conceptual and empirical difficulties associated with it. With respect to the conceptual problems, Chomsky pointed out the redundancy between the theories of Case and binding. In "On Binding" (Chomsky, 1980), both Case theory and binding theory had distinguished the subject of infinitives as special: Case theory had singled out the subject of an infinitive as the one position that is not marked for Case and binding theory singled out the same position as the only transparent domain with respect to anaphoric phenomena. A related question is

---

application to the subject of a tensed clause.

what the two domains relevant for binding theory, i.e., the subject of a tensed sentence (NIC) and the c-command domain of the subject of an NP or S (SSC), have in common. To solve these problems, Chomsky (1981) developed the theory of binding within the theory of government. Government and c-command were defined, in simplified form, as in (4) and (5), respectively.

(4) Government (Chomsky, 1980, p. 25)

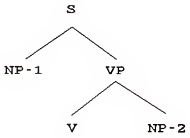
α is governed by β if α is c-commanded by β and no major category or major category boundary appears between α and β.

(5) C-command (Reinhart, 1976, p. 32)

Node A c(constituent)-commands node B if neither A nor B dominates the other and the first branching node dominating A dominates B.

Consider a tree like (6):

(6)



In (6), NP-1 c-commands NP-2 since S, the first branching node dominating NP-1, also dominates NP-2 and neither NP-1 nor NP-2 dominates the other. NP-2, however, does not c-command NP-1 since VP, the first branching node dominating NP-2, does not dominate NP-1. In terms of Government, V governs NP-2 since V c-commands NP-2 and no major category appears between V and NP-2.

Having defined government as in (4), Chomsky (1981) presented a characterization of binding domain in terms of what he called a "governing category". The notion governing category is defined as follows:

(7) α is the governing category for β if and only if α is the minimal category containing β and a governor of β, where α = NP or S. (Chomsky, 1981, p. 188)

The binding theory Chomsky (1981) proposed can be summarized as in (8):

(8) Binding Theory (p. 188)
    (A) An anaphor is bound in its governing category.
    (B) A pronominal is free in its governing category.
    (C) An R-expression is free.[2]

The anaphors include the reflexives, reciprocals, PRO and NP-trace. The pronominals include overt pronouns and the empty categories pro and PRO. Chomsky stated that all of these principles involve A-binding, that is, binding by an NP in a potential argument position. Bound and free are defined as follows (p.184-5):

---

[2] Chomsky (1982) argued that Principle C was not part of the grammar. However, recently arguments for the existence of "Condition C" effects were provided. See Lasnik (1989).

(9) (i) α is A-bound by β if and only if α and β are coindexed, β c-commands α, and β is in an A-position.

(ii) α is A-free if and only if it is not A-bound.

Now, two conceptual problems noted above were solved under this formulation of the binding theory. First, the redundancies between Case and the binding theory were eliminated. The subject of an infinitive, the Caseless position which is transparent with respect to anaphoric phenomena, was now defined as the ungoverned position. In terms of the relationship of two opaque domains, NIC and SSC were derived from the binding theory, reducing two conditions to one.

Consider the following examples:

(10) a. John$_i$ hurt himself$_i$.

b. *John$_i$ believes [that [himself$_i$ is the best]].

c. John$_i$ believes [himself$_i$ to be the best].

d. *John$_i$ thinks [that [Mary hurt himself$_i$]].

(11) a. *John$_i$ likes him$_i$.

b. *John$_i$ expected him$_i$ to win.
c. John$_i$ expected [Mary to invite him$_i$]
d. John$_i$ expected [that [he$_i$ would win]

(12) a. *John$_i$ likes John$_i$.
b. *John$_i$ thinks John$_i$ likes Mary.
c. John$_i$ thinks he$_i$ likes Mary.
d. *He$_i$ thinks John$_i$ likes May.

In (10a) *himself* is bound by *John*. In (10b) and (10d) the reflexive has to be bound in the lower clause but it is free. Therefore, these sentences are ruled out. (10b) and (10d) illustrate the case of NIC and SSC, respectively. (10c) is grammatical since the reflexive is not governed in the lower clause, which lacks Tense, and so it can be bound to the matrix subject.

In (11a) *him* must be disjoint in reference from *John*. In (11b) the governing category for the pronoun is the matrix clause in which *him* must be disjoint in reference from *John*. (11c) and (11d) are grammatical because the pronoun is free in its governing category and does not have to be disjoint in reference from *John*.

(12a) and (12b) are ungrammatical since the R-expression *John* is not free. (12c) is perfect because *he* does not c-command *John* and thus does not bind *John*. In (12d) *John* is bound by *He*, which is not allowed.

Although Chomsky's formulation of governing category

(1981, p. 188) provided largely correct predictions, Principle A wrongly excluded examples such as (13) as ill-formed.

(13) a. We$_i$ read [$_{NP}$ each other$_i$'s books].

b. We$_i$ thought [that [$_{NP}$ pictures of each other$_i$] would be on sale].

In (13a) and (13b) each other is governed by the head of N' and the preposition of, respectively, so that NP is the governing category. Since each other is not bound in its governing category, both sentences are incorrectly rejected under the definition of the governing category given in (7).

To solve this empirical problem, Chomsky (1981, p. 211) revised the notion of governing category as follows:

(14) Governing Category (Revised)

α is a governing category for β if and only if α is the minimal category containing β, a governor of β, and a SUBJECT accessible to β.

a. SUBJECT

SUBJECT is AGR or subject.

b. Accessibility

α is accessible to β if and only if β is in the c-command domain of α and the assignment to β of the index of α would not violate the i-within-i condition.

c. i-within-i condition

$*[_{i} \ldots \quad _{i} \ldots]$

Chomsky points out a number of advantages in adopting definition (14). First of all, this formulation permits collapsing the NIC and the SSC of Chomsky (1980), thereby eliminating certain cenceptual problems associated with the older framework. Furthermore, the notion of accessible SUBJECT included in the revised definition of governing category makes it unnecessary to stipulate NP and S as the only possible governing categories, since these are the only categories having accessible SUBJECTs.

Problems in the Standard Binding Theory

Noncomplementary distribution of anaphors and pronouns. Huang (1983) discusses a class of sentences that are a problem for principles (A) and (B) of the binding theory of Chomsky (1981). The problematic sentences all show noncomplementary distribution of anaphors and pronouns, contrary to what principles (A) and (B) predict.

(15) a. *They* saw *each other*'s pictures.

b. *They* saw pictures of *each other*.

c. *They* expected that pictures of *each other* would be on sale.

d. *They* expected that for *each other*'s pictures to be on sale would be possible.

e. They expected that for each other to come would be possible.

f. They expected that it would be possible for pictures of each other to be on sale.

(16) a. They saw their pictures.

b. They saw pictures of them.

c. They expected that pictures of them would be on sale.

d. They expected that for their pictures to be on sale would be possible.

e. They expected that for them to come would be possible.

f. They expected that it would be possible for pictures of them to be on sale.

Although Huang (1983) gives examples with reciprocal anaphors only, reflexives can also alternate with pronouns in a subset of the instances where this is possible for reciprocals (Bouchard 1985).

(17) a. They saw pictures of themselves.

b. They expected that pictures of themselves would be on sale.

c. They expected that for themselves to come would be possible.

d. They expected that it would be possible for pictures of themselves to be on sale.

Huang (1983) noticed that the formulation of governing category in terms of accessible subject (given in (14)) makes the right predictions for anaphors, but not for pronouns in NP. It wrongly assigns disjoint reference in the examples given in (16). To solve this problem, Huang proposed a modification of governing category, in which the accessibility of the SUBJECT is stipulated as a requirement for anaphors, but not for pronouns. He claimed that this distinction is conceptually motivated by the fact that anaphors need to have accessible subjects, capable of being antecedents, as defined by the accessibility condition in (14b), but pronouns need no antecedents, and the requirement that a potential antecedent be present for a pronoun within a domain where disjoint reference is required seems to be totally without reason. Therefore, Huang (1983) modified Chomsky's (1981) definition of governing category as follows (p. 557):

(18) α is a governing category for β if and only if α is the minimal category containing β, a governor of β, and a SUBJECT that, if β is an anaphor, is accessible to β.

Let us see how Huang's modification of governing category solves the noncomplementarity problem. Consider the following examples.

(19) a. $[_S$ They$_i$ like $[_{NP}$ their$_i$ pictures$]]$

b.[$_S$ They$_i$ like [$_{NP}$ each other$_i$'s pictures]]

Huang's (1983) modified definition of governing category makes it possible that pronouns and anaphors have different govening categories. In the above examples, the governing category for *each other* is the S, whereas the governing category for *their* is the NP. Since *each other* is bound in its governing category, (27b) is well-formed. Since *their* is free in its governing category, (27a) is also well-formed. Huang's solution for the noncomplementarity problem was reflected in Chomsky's (1986a) revision of binding theory, as will be seen below.

The parameterization of binding theory. Since Chomsky (1981) proposed the binding theory, much work has been done in languages other than English. That research has shown that Chomsky's binding theory, as summarized above, is not adequate to account for the behavior of the anaphors and pronominals of many languages. Let us consider the following data:

(20) English

a. *The boys$_i$ said [themselves$_i$ would go].

b. John$_i$ expected [Mary to invite him$_i$].

Italian

Alice$_i$ guardò i [ritratti di sè$_{i/j}$ di Mario$_j$].

Alice looked at portraits of self of Mario

'Alice$_i$ looked at Mario$_j$'s portraits of self$_{i/j}$'

Icelandic

a. Jón$_i$ segir [að [Maria$_j$ elski sig$_{i/j}$]].

Jon$_i$ says that Maria$_j$ loves(subjunctive)self$_{i/j}$

b. *Jón$_i$ skipaði [mér að raka hann$_i$].

Jon$_i$ ordered me to shave him$_i$

Japanese

John-wa$_i$ [Bill-ga$_j$ zibun-o$_{i/j}$ nikunde iru] to omotte iru.

John-TOP Bill-NOM self-ACC hates that thinks

'John$_i$ thinks that Bill$_j$ hates self$_{i/j}$'

In order to account for crosslinguistic variation in binding properties, Koster (1984), Yang (1983), and Wexler and Manzini (1987) propose that the notion of governing category be parameterized. Wexler and Manzini, for example, propose the governing category parameter as in (21):

(21) γ is the governing category for α iff γ is the minimal category that contains α and a governor for α and has

a) a subject; or

b) an INFL; or

c) a tense; or

d) a "referential" tense[3] (=indicative mood); or

---

[3] In Icelandic "referential" tense is an indicative tense, whose properties are inherently defined, as opposed to an "anaphoric" tense, whose properties depend upon some superordinate tense. An indicative tense is always a "referential" tense, while an "anaphoric" tense is always a subjunctive tense (Manzini and Wexler, 1987, p. 417).

e) a "root" tense

Languages choose a proper value from among these five governing categories. For example, English himself assumes value (a), Icelandic sig value (d), Japanese zibun value (e), and so on.

The Revised Binding Theory

Chomsky (1986a), following ideas of Huang (1983), proposes a reformulation of the binding conditions in terms of the notion "Complete Functional Complex". A CFC is defined as follows:

(22) A CFC is the domain in which all grammatical functions associated with a head are realized.

Chomsky's restatement of the binding theory can be summarized as in (23):

(23) a. The indexing I and the pair (α, β) are compatible with respect to the binding theory (BT) if α satisfies the binding theory in the local domain β under the indexing I:
I is BT-compatible with (α, β) if:
(A) α is an anaphor and is bound in β under I

(B) α is a pronominal and is free in β under I

(C) α is an r-expression and is free in β under I

b. The licensing condition for a category α governed by a lexical category γ in the expression E with indexing I:

For some β such that (i) or (ii), I is BT compatible with (α, β):

(i) α is an r-expression and (a) if α heads its chain α or (b) otherwise

(a) β = E

(b) β is the domain of the head of the chain of α

(ii) α is an anaphor or pronominal and β is the least CFC containing γ for which there is an indexing J BT-compatible with (α, β)

In the formulation given above, the conditions for r-expressions are unchanged. For α an anaphor or pronominal, the licensing condition states that the relevant governing category for α is the minimal CFC in which the binding theory can be satisfied under some indexing. To identify the binding domains, these definitions mention neither an accessible, nor a SUBJECT, nor specific projections, such as NP or S, as in Chomsky (1981). The fact that a subject usually defines the binding domain is derived from the requirement that the functional complex be complete.

In certain instances, the notion of CFC results in a different governing category for an anaphor and pronoun in the same structural position. This is one respect in which the new binding theory differs empirically from the previous one, i.e., Chomsky (1981). For example, in the sentence in (24) NP constitutes the governing category for the pronoun, whereas IP is the domain in which the anaphor must be bound.

(24) $[_{IP}$ The children like$[_{NP}$ each other's/their friends]]

NP constitutes the governing category for the pronoun because it is the least CFC in which the pronoun can be free. The governing category for the anaphor is IP because the latter is the least CFC containing a potential antecedent, that is, the minimal domain in which the anaphor could be bound. Thus, in the revised binding theory, the problem of noncomplementary distribution of anaphors and pronouns, which was a problem in the standard binding theory (Chomsky 1981), was solved.

Chomsky (1986a) also claims that anaphors undergo LF-movement to the INFL position leaving a trace. At the LF level, then, there would be no overt anaphors in A-positions but only the anaphor trace. Therefore, if binding theory is restricted to LF, as Chomsky argues, binding condition (A) would hold not of the antecedent-anaphor relation but of the anaphor-trace relation. Consider the following example:

(25) *John$_i$ thinks that [$_{IP}$ himself$_i$ is OK]

In the binding theory of Chomsky (1981), (25) is ungrammatical because the theory demands that the anaphor be bound inside the embedded clause, which contains AGR, a putative accessible SUBJECT. In the revised binding theory, the assumption that AGR can be a potential binder for the anaphor in subject position has been dropped. This means that the Tensed S effect on binding is not explained by the binding theory. Instead, Chomsky proposes that the ungrammaticality of (25) is due to LF-movement: The anaphor must raise to INFL of the higher clause at LF, resulting in an ECP-violation, under the assumption that the traces of the anaphor must be properly governed. This proposal amounts to eliminating the condition NIC for anaphors.

LF-Movement to INFL Theory

In recent years, a new analysis of the reflexive anaphor has raised considerable interest. Inspired by the work of Lebeaux (1983) and Chomsky (1986a), a number of linguists (Pica, 1987; Battistella, 1989; Huang and Tang, 1991; Cole et al., 1990) have suggested that reflexives may be raised in LF into Infl, in a way analogous to clitic movement in syntax, thereby accounting for their subject orientation. Furthermore, certain such reflexives may move from Infl to Infl successivecyclically, thereby accounting for their long-distance possibilities. Within LF-movement to INFL theory, it has been argued that since parameterizing the governing category makes the notion of governing category almost vacuous, the LF-movement analysis of reflexives is more adequate on explanatory grounds. In what follows I summarize Cole, Hermon, and Sung's (1990) proposal.

Cole et al. (1990) argue that apparently unbounded dependencies between reflexives and their antecedents are in fact local in nature. According to them, the apparent differences amonglanguages in locality for reflexives follow from the interaction of a certain property of the languages in question (i.e., whether Infl is lexical and hence an L-marker and proper governor), with the ECP and with general constraints on the movement of X^o and X^{max} projections. The assumptions underlying Cole et al.'s analyses are as follows:

A. The movement of an X^o projection must involve adjunction to another X^o projection. An X^{max} projection, in contrast, must adjoin to a maximal projection. The movement of X^o is subject to the usual conditions on movement, including the ECP. Following Chomsky (1986b), it is assumed that non-L-marked maximal projections constitute barriers to antecedent government (with the exception of IP).

B. Languages may differ with regard to whether certain categories are functional or lexical. For example, Infl is lexical in Chinese, Korean, and Japanese,[4] whereas it is functional in English.

With these assumptions, Cole et al. (1990) show how the presence of lexical Infl licenses the occurrence of long-distance reflexives in Chinese. Consider the structure underlying (26), which is shown in (27):

(26) Zhangsan renwei [Lisi zhidao [Wangwu xihuan ziji]].
Zhangsan thinks Lisi knows Wangwu like self
'Zhangsan thinks that Lisi knows that Wangwu likes himself'

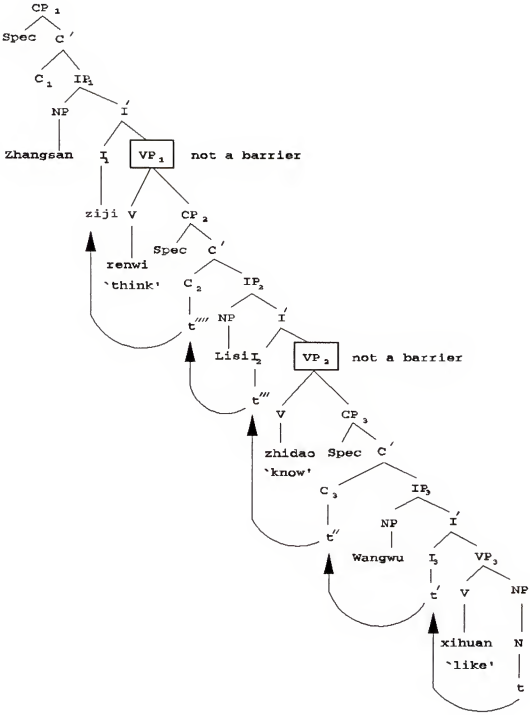
As seen in (27), the reflexive noun *ziji* moves to the Infl of its own clause, and from there it continues up the tree, eventually ending up adjoined to the Infl of the main clause. Following the general principle of head-to-head movement, it may move up the tree so long as it does not violate any constraint on movement.

In terms of the binding theory, the structure (27) contains no violations of the binding theory. The anaphor *ziji*, which is adjoined to Infl$_1$ is bound to a c-commanding element, the subject *Zhangsan*. The governing category for t is its own clause, and t is coindexed with a c-commanding element

---

[4] This claim is based on the occurrence of nongap topics and null topics (topic chains), and the absence of *that*-trace effects in these languages.

(27)


CP1
Spec
C'
C1
IP1
NP
I'
Zhangsan
I1
VP1
not a barrier
ziji
V
CP2
renwi
'think'
Spec
C'
C2
IP2
t''''
NP
I'
Lisi
I2
VP2
not a barrier
t'''
V
CP3
zhidao
'know'
Spec
C'
C3
IP3
t''
NP
I'
Wangwu
I3
VP3
t'
V
NP
xihuan
'like'
N
t

(the trace t′ adjoined to Infl) within that domain. Similarly, t′ is bound in its governing category. It is coindexed with t", which is adjoined to Comp. The governing category for t" is CP_2. The trace t" is bound by the trace adjoined to $Infl_2$ (t"′). The remaining traces are properly bound in a similar fashion.[5]

In terms of the ECP, the first trace t is lexically governed by VP_3, and thereby it has no problem. The t′ is antecedent-governed by t" since no barriers intervene between Infl and Comp. But movement from $Comp_3$ to $Infl_2$ crosses VP_2. However, in Chinese Infl is lexical, and therefore VP is L-marked and is not a barrier. As a result, the trace adjoined to $Comp_3$ is properly governed by antecedent government. The same principles apply to subsequent instances of movement. Thus, all traces are properly governed, and long-distance reflexives like those in (27) are well-formed in Chinese.

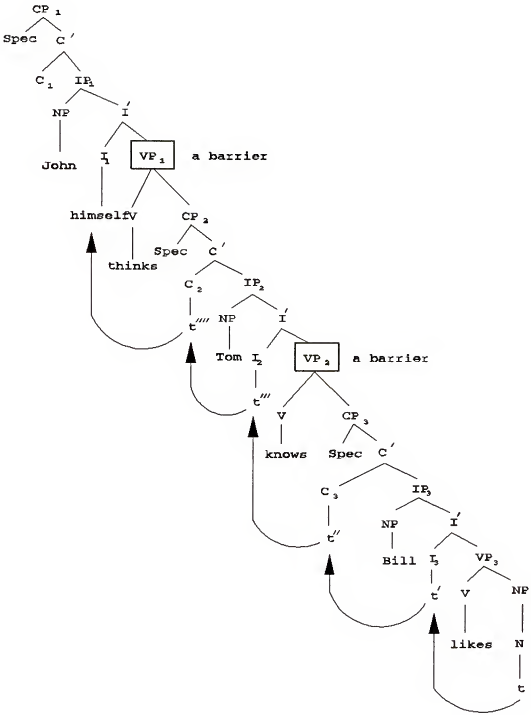
Let us now examine why languages like English lack long-distance reflexives. Consider the structure underlying (28), which is shown in (29):

(28) John thinks [Tom knows [Bill likes himself]].

---

[5] Cole et al. say that it is unclear whether X^o-traces are anaphors although lexical anaphors and NP-traces are clearly subject to Principle A of the binding theory. However, according to Chomsky (1986a), binding condition (A) is effect by the anaphor-trace relation.

(29)


CP1
Spec
C′
C1
IP1
NP
I′
John
I1
VP1
a barrier
himself
V
CP2
thinks
Spec
C′
C2
IP2
t′′′′
NP
I′
Tom
I2
VP2
a barrier
t′′′
V
CP3
knows
Spec
C′
C3
IP3
t′′
NP
I′
Bill
I3
VP3
t′
V
NP
likes
N
t

In (29), the binding theory works just as it does in Chinese. In terms of the ECP, the movement of the reflexive to the Infl of its own clause is well-formed, since the trace left in object position is lexically governed by the verb of CP_3. The second movement also has no problem because no barriers intervene between t′ and t". However, the movement from C_3 to $Infl_2$ is ill-formed. Since in English Infl is not lexical, and hence does not L-mark VP, VP is a barrier. Thus, in English long-distance reflexives are blocked by the ECP.

In summary, Cole et al.'s main claim is that a unified and entirely local theory of antecedence for bound anaphora is possible.

Binding Theory in Korean

Basic Description of Korean Anaphora

Korean has two types of reflexive forms caki 'self' and casin 'self', a reciprocal selo 'each other', and pronouns ku 'he' and kunye 'she'.[6] With respect to the two reflexive forms, neither caki nor casin shows any gender distinction, and both seem to agree in number with an antecedent. However, these two reflexives exhibit a difference in person agreement:

---

[6] These are singular anaphoric forms. Plural forms are formed by adding the plural marker -tul to these singular forms.

while casin can be used as a first-, second-, and third-person reference, caki[7] can not be used as a first- and second-person reference.[8] The pronoun ku and kunye are used for male and female third person reference, respectively.[9]

Korean Anaphors and Binding Theory

Reciprocals. Yang (1983) proposed (30) for reciprocal-binding across languages:

(30) Reciprocal-Binding Principle

> A reciprocal is bound in the c-domain of its c-commanding minimal SUBJECT.

---

[7] Some people (Cole et al., 1990; Park, 1988; Yoon, 1988) claim that in Korean caki is not an anaphor but a pronoun. However, on the basis of the arguments given by Yang (1991) and Lee (1992), I assume that caki is an anaphor. For a detailed discussion, see Yang (1991, p. 409-10). In this dissertation, caki and casin are used interchangeably, unless noted.

[8] Cakicasin, which is often considered the third type of reflexive in Korean, is an emphatic form of either caki or casin. Cakicasin is used as a third-person referent. While caki or casin can take a long-distance antecedent as well as a local one, cakicasin cannot take a long-distance antecedent. Consider the following example.

John$_i$-un [Bill$_j$-i cakicasin$_{j,*i}$-ul piphanhass-ta-ko] saengakhess-
Top Nom self-Acc criticized-Dec-Comp thought-
ta.
DEC
'John$_i$ thought that Bill$_j$ criticized himself$_{j,*i}$'

[9] There are other pronouns in Korean. First- and second-person pronouns will not be considered in our discussion.

Yang claimed that the i-within-i accessibility condition of SUBJECT is not universal crosslinguistically and thus it should not be included in the universal binding principle but should be posited as a language-specific parameter in the grammar of the language where it is required. For example, in English the i-within-i accessibility condition of SUBJECT is necessary as seen in the contrast of (31a) and (31b):

(31) a. *The boys$_i$ thought that each other$_i$ was smart.
b. The boys$_i$ thought that pictures of each other$_i$ would be on sale.

On the other hand, in languages like Korean, which lack AGR[10], no effect of the Tensed-S Condition or the Nominative Island Condition is observed and thus the i-within-i accessibility condition of SUBJECT is irrelevant. Consider the following Korean examples:

(32) a. kutul$_i$-un [kutul$_j$-i selo$_{j,*i}$-lul salanghanun-kes-ul]
they-TOP they-NOM each other-ACC love-COMP-ACC
kippehan-ta.
pleased-DEC
'They$_i$ are pleased [that they$_j$ love each other$_{j,*i}$]'
b. kutul$_i$-un [kutul$_j$-ey selo$_{j,*i}$-e tehan salang-ul] alko

---

[10] Yang (1983) assumes that languages like Korean and Japanese have no noticeable AGR of any kind in their syntax.

they-TOP they-GEN each other-LOC about love-ACC know

iss-ta.

is-DEC

'They$_i$ know [their$_j$ love to each other$_{j,*i}$]'

c. kutul$_i$-un [selo$_i$-ka yengliha-ta-ko] saengakhan-ta.

They-TOP each other-NOM clever-DEC-COMP think-DEC

'They$_i$ think [that each other$_i$ is clever]'

b. kutul$_i$-un [selo$_i$-ey ai-ka yengliha-ta-ko]

they-TOP each other-GEN child-NOM clever-DEC-COMP

saengakhan-ta.

think-DEC

'They$_i$ think that [each other's$_i$ child] is clever'

(32a) and (32b) show that selo must be bound in the lower clause and inside NP, respectively since they are the c-domain of the reciprocal's c-commanding minimal SUBJECT. These are the cases of the Specified Subject Condition. (32c) and (32d) show that neither the Tensed-S Condition nor the i-within-i accessibility condition of SUBJECT is relevant to reciprocal binding in Korean.

Reflexives[11]. Compare the Korean examples in (33) with the corresponding English examples in (34):

---

[11] In Korean, reflexives may be discourse-bound, given proper context. Consider the following example (Yang, 1983, p. 186-7).

A: John$_i$-i salam-ul ponayss-ni?
John-NOM man-ACC sent-Q
'Did John$_i$ send a man'
B: ani, caki$_i$-ka cikcep wass-ta.

(33) a. John$_i$-i [caki$_i$-ka ttokttokha-ta-ko] malhayss-ta.
John-NOM self-NOM be smart-DEC-COMP said-DEC
'John$_i$ said that self$_i$ was smart'

b. John$_i$-i[Mary$_j$-ka casin$_{i,j}$-ul kwacanhanta-ko] malhayss-ta.
John-NOM Mary-NOM self-ACC overpraise-COMP said-DEC
'John$_i$ said that Mary$_j$ overpraised self$_{i,j}$'

c. John$_i$-i [Mary$_j$-ey casin$_{i,j}$-etahan kisa-lul] ilkess-ta.
John-NOM Mary-GEN self-about article-ACC read-DEC
'John$_i$ read [$_{NP}$ Mary's$_j$ article about self$_{i,j}$]'

d. John$_i$-i [Mary$_j$-ey casin$_{i,j}$-etahan kisa-ka] kecitira-ko
John-NOM Mary-GEN self-about article-NOM false-COMP
malhess-ta.
said-DEC
'John$_i$ said that [$_{NP}$ Mary's$_j$ article about self$_{i,j}$] was false'

(34) a. *John$_i$ said that himself$_i$ was smart.

b. *John$_i$ said that Mary overpraised himself$_i$.

c. *John$_i$ read Mary's$_j$ article about himself$_i$.

d. *John$_i$ said that Mary's$_j$ article about himself$_i$ was false.

No, self-Nom in person came-DEC
'No, self$_i$ came in person'

This dissertation is not concerned with other than syntactic conditions of anaphora.

As seen in examples given above, Korean reflexive caki or casin can be coreferential with either John or Mary in cases in which binding by John is disallowed in English.

Observing these differences between anaphor binding in Korean and that in English, Hong (1985) claimed that the notion "governing category" is irrelevant in Korean binding and proposed the following Korean-Binding Principle:

(35) Korean-Binding Principle (Reflexives)

A reflexive is bound.

Yang (1983) distinguished between unmarked reflexives and marked reflexives. According to him, the unmarked reflexives across languages are "phrasal reflexives", while marked reflexives are "nonphrasal reflexives". English and Korean reflexives are examples of unmarked reflexives and marked reflexives, respectively. The binding principles proposed by Yang for unmarked reflexives and marked reflexives are as in (36) and (37), respectively. (36) is basically the same as the Reciprocal-Binding Principle (30).

(36) Unmarked Reflexive-Binding Principle

An unmarked reflexive is bound in the c-domain of its c-commanding minimal SUBJECT.

(37) Marked Reflexive-Binding Principle

A marked reflexive is bound in the c-domain of its c-commanding minimal SUBJECT.

(i) SUBJECT=AGR only

(ii) AGR is parameterized:

  a. AGR=INFL of a finite clause (for Russian, etc.)

  b. AGR=INFL of an indicative clause
  (for Icelandic, etc.)

  c. AGR=COMP (for Dutch, etc.)

  :

(iii) [+marked] reflexive -> [+subject control]

As for the marked reflexives, Yang argued that since marked reflexives generally disobey the Specified-S Condition, SUBJECT should be parameterized as "AGR only" and that the AGR has to be further parameterized, as seen in (37ii). He also claimed that the antecedent of a marked reflexive must be a subject, unlike unmarked reflexives or reciprocals.

As for the subject-control property of the marked reflexives (37iii), assuming that the unmarked antecedent is the most prominent NP in the available domain, i.e., the subject, Yang (1983) posited the following independent principle:

(38) An anaphor should have either the unmarked domain (as defined in (30) or (36) above) or the unmarked antecedent.

Yang (1983) accounts for Korean sentences like (39) which show unbounded reflexive-binding by the principles (37) and (38).

(39) John$_i$-un [Bill$_j$-i [Mary$_k$-ka [Tom$_l$-ey caki$_{i,j,k,l}$-e tahan
John-TOP Bill-NOM Mary-NOM Tom-GEN self toward
thato]-lul silehan-ta-ko] saengakhan-ta-ko] mitnun-ta.
attitude-ACC hate-DEC-COMP think-DEC-COMP believe-DEC
'John$_i$ believes [that Bill$_j$ thinks [that Mary$_k$ hates [Tom$_l$'s
attitude toward self$_{i,j,k,l}$]]]'

According to the characterization of the unmarked and marked reflexives, reflexives of Korean are marked ones, and this language lacks AGR. If it is assumed that Korean does not have any language-specific exceptional features with respect to the Marked Reflexive-Binding Principle, this principle predicts that the marked reflexives of this language do not have any binding domain simply because it does not have AGR, and the subject-control property of these marked reflexives is determined by the principle (38).

LF-movement analysis of Korean reflexives. Some recent studies in Korean linguistics (Kang, 1990; Lee, 1992) have attempted to explain the long-distance anaphors like caki and casin within the local binding theory. In LF-movement to INFL theory, the antecedent-anaphor relation becomes a government relation, not a binding-theoretic relation (Chomsky, 1986a, p.

175). Here, I summarize Kang's (1990) proposal.

In Kang (1990), the following basic assumptions are provided.

A. The "nonphrasal" reflexives, which are typically long-distance reflexives, are actually heads, while the "phrasal" reflexives, which are typically of the English type, are XP's.

B. XP reflexives, since they are maximal projections, can adjoin to the VP node and hence they can be governed by the non-subject at the VP adjunction position. But the reflexives that are heads must substitute I, hence they cannot be governed by non-subjects.

C. Reflexives are a kind of functional element. The functional head induces minimality for the functional head, following Rizzi (1987). VP is a barrier in Korean[12]. However, inherent barriers are ignored in LF movement of reflexives. What matters in the reflexive movement is the "functional" minimality barriers.

With these assumptions, Kang (1990) accounts for successive cyclic movement of Korean reflexives. Examples include the following:

(40) a. John_i-i [[Mary-ka [caki_i tongsaeng-eke cu-n] ppang-
John-NOM Mary-NOM self's brother-DAT gave bread-

---

[12] Kang assumes that Korean Infl, which lacks overt AGR, is arguably weak and cannot L-mark VP, while Lee (1992) assumes that Infl in Korean is lexical, and thereby it L-marks VP.

ul] mekess-ta.

ACC ate-DEC

'John$_i$ ate the bread that Mary gave to self$_i$'s brother'

b. *John$_i$-i [[Mary-ka [caki$_i$ cip-ese] mandu-n] ppang-

John-NOM Mary-NOM self's house-LOC made bread-

ul] mekess-ta.

ACC ate-DEC

'John$_i$ ate the bread that Mary made at self$_i$'s house'

In example (40a), the reflexive is the specifier of an argument and in (40b) the reflexive is the specifier of the adjunct within the relative clause. The data given above show that the reflexive may refer to the matrix subject where it is the specifier of an argument, whereas the coreferential reading between the reflexive and the matrix subject becomes impossible where the reflexive is the specifier of the adjunct - so-called "argument-adjunct asymmetry". In order to account for this fact, Kang (1988) assumes that there is a wh-movement in relative clauses[13] and after the movement there is a SPEC-head agreement in COMP, which induces an operator-like element in the C position. He also assumes that in order for substitution to work, the overt functional element within I (or C) is not visible for the purpose of the reflexive movement. Kang's explanation for the asymmetry in (40a) and (40b) is as follows.

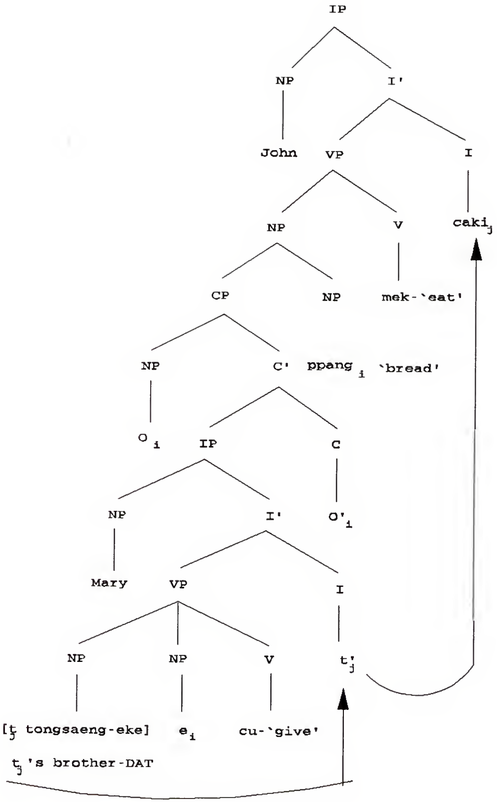
---

[13] In Korean, there is no overt wh-pronoun in relative clauses. We assume that there is always an empty operator involved in Korean relativization.

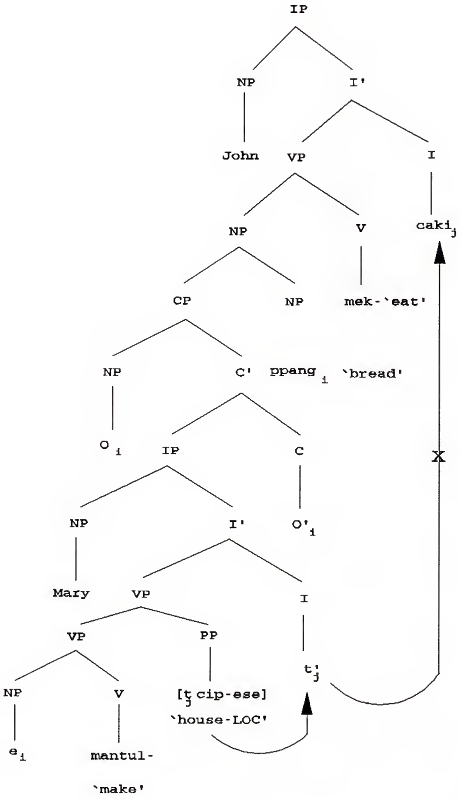
First, let us consider (40a), the structure of which is shown in (41). In (41), caki will first move to the lower I. In the next step, the reflexive cannot move into C, since it is already filled by the operator O'_i, which has been induced by the relative operator O_i. This empty operator O'_i at the C position functions as a minimality barrier, since it is a functional operator. However, this does not cause any problem. The reflexive in the lower I position will antecedent govern its original trace and hence gamma-mark it. Then the reflexive can freely move out of the lower CP skipping the C-position, since its intermediate trace can be freely deleted, following Lasnik & Saito (1984). Hence, the reflexive can move to the upper I, where it will be governed by the matrix subject. As a result, caki can refer to the matrix subject John.

Now let us see how such movement works for the example (40b). In this case, the first step of the movement will be into the lower I. The reflexive in the lower I will antecedent govern the original trace within the adjunct. In the next step, it cannot again go into C, which is already filled by an empty operator and hence it must move directly to the higher I. In the structure (42) below, the intermediate trace t'_j in the lower I cannot be deleted, since it is a trace of an adjunct-like element (Lasnik & Saito, 1984). Now we see that this intermediate trace cannot be antecedent governed by the

(41)


IP
NP
I'
John
VP
I
NP
V
caki_j
CP
NP
mek-`eat'
NP
C'
ppang_i `bread'
O_i
IP
C
NP
I'
O'_i
Mary
VP
I
NP
NP
V
t'_j
[t_j tongsaeng-eke]
e_i
cu-`give'
t_j 's brother-DAT

(42)


IP
NP
I'
John
VP
I
NP
V
$caki_j$
CP
NP
mek-`eat'
NP
C'
$ppang_i$ `bread'
O_i
IP
C
X
NP
I'
O'_i
Mary
VP
I
VP
PP
t'_j
NP
V
[t_j cip-ese]
`house-LOC'
e_i
mantul-
`make'

reflexive in the higher I, since the operator in C intervenes between them, assuming that interveneing operator in C induces minimality. Thus, the intermediate trace t'_j becomes an offending trace, and the sentence (40b) is ruled out, as desired.

Kang (1990) argues that this approach is more explanatory than the parameterized binding theory in that we can claim that only the following condition is stipulated within the UG:

(43) Reflexives must be governed by the antecedent.

(43) is the way in which the reflexives pick up their reference. In order for (43) to be possible the following must happen:

(44) Move reflexives freely.

Given (43) and (44), the subject orientation of long distance reflexives follows.

Pronominal Binding in Korean

Compare the English examples in (45) and the corresponding Korean examples in (46):

(45) a. He left.

b. John$_i$ thinks that he$_i$ is smart.

c. *John$_i$ criticized him$_i$.

d. John$_i$ thinks that Mary loves him$_i$.

e. *John's$_i$ book about him$_i$.

(46) a. ku-ka ttenass-ta.

he-NOM left-DEC

'He left'

b. John$_i$-i ku$_i$-ka ttokttokha-ta-ko malhayss-ta.

John-NOM he-NOM smart-DEC-COMP said-DEC

'John$_i$ said that he$_i$ was smart'

c. *John$_i$-i ku$_i$-lul pipanhayss-ta.

John-NOM he-ACC criticized-DEC

'John$_i$ criticized him$_i$'

d. John$_i$-i Mary-ka ku$_i$-lul coahan-ta-ko malhayss-ta.

John-NOM Mary-NOM he-ACC likes-DEC-COMP said-DEC

'John$_i$ said that Mary likes him$_i$'

e. *John$_i$-uy ku$_i$-etayhan chayk

John-GEN he-about book

'John's$_i$ book about him$_i$'

The English examples given in (45) and the Korean examples given in (46) pattern together as far as the distribution of a pronominal is concerned. Therefore, Hong (1985) claimed that binding principle B holds for Korean pronominals, just as for English pronominals. Her formulation of Korean-Binding principle (Pronominals) is as follows:

(47) Korean-Binding Principle (Pronominals)

A pronominal is free in its governing category.

Governing category: α is a governing category for β if α is the minimal NP or S containing β and a governor of β. (Chomsky 1981:188)

Notice here that she adopted the definition of governing category in which the accessibility of a SUBJECT is irrelevant.

Binding Theory and Language Acquisition

The Governing Category Parameter and the Proper Antecedent Parameter

In relation to the binding theory, Wexler and Manzini (1987) propose the Governing Category Parameter (GCP) and the Proper Antecedent Parameter (PAP).

Wexler and Manzini argue that since languages vary as to what counts as a governing category, the notion of governing category be parameterized as in (48):

(48) (=21) γ is the governing category for α iff γ is the minimal category that contains α and a governor for α and has

a) a subject; or

b) an INFL; or

c) a tense; or

d) a "referential" tense (=indicative mood); or

e) a "root" tense

This parameter is concerned with how far away the antecedent can be from the reflexive. As seen in the previous sections, in languages like English reflexives must be bound within the same clause. However, in languages like Japanese and Korean reflexives may take any NP as an antecedent as long as it is within the main clause. Languages like Russian treat reflexives differently depending on whether they occur in finite or nonfinite clauses. Consider the following sentence as an illustration:

(49) John thinks that [Bill wants [Tom to love himself]].

In (49), English reflexives allow only Tom to be an antecedent, Russian reflexives allow both Bill and Tom but not John as a potential antecedent, and Korean reflexives allow all three of them to be an antecedent.

Another parameter proposed by Wexler and Manzini (1987) is the Proper Antecedent Parameter. It is defined as in (50):

(50) A proper antecedent for α is

a. a subject β; or

b. any element β whatsoever.

This parameter is concerned with what types of NPs can serve as antecedents for reflexives. While languages like English allow subjects and nonsubjects to be the antecedents of reflexives, languages like Korean and Japanese allow only subjects as the antecedents of reflexives. Consider the following sentence:

(51) John showed Bill a picture of himself.

In (51) in the case of English, both John and Bill can serve as the antecedent of the reflexive. However, in Korean or Japanese, only John can be the antecedent of the reflexive.

The Subset Principle and the Parameters of Binding Theory

The Governing Category Parameter and the Proper Antecedent Parameter are proposed parameters of UG which meet the Subset Condition. That is, they yield languages which fall into a subset relation. This is illustrated in figures 3 and 4. As figure 3 indicates, the values of the GCP form a hierarchy. Languages like English which assume value (a) of the GCP are a subset of other languages which assume value (b), (c), (d) or (e) with reference to reflexive binding. Languages like Korean which assume value (e) of the GCP are a superset of other languages which assume value (a), (b), (c) or (d). Languages like Russian which assume value (c) are a

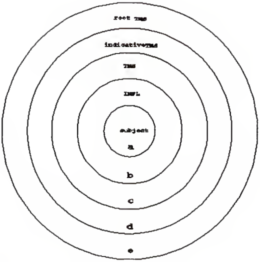


Figure 3 The Governing Category Parameter

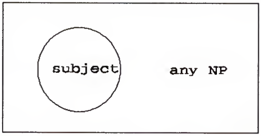


Figure 4 The Proper Antecedent Parameter

subset of languages assuming value (d) or (e) but a superset of languages assuming value (a) or (b). Thus, as far as the GCP is concerned, English is one of the most restrictive languages and Korean is one of the least restrictive languages. With regard to the PAP, languages like Korean are a subset of languages like English since the latter allow any

NPs as the antecedents of reflexives, whereas the former only allow subjects.

The Subset Principle states that given two languages, one of which is a subset of the other, if both are compatible with the input data, the learning function must pick the smaller one. Considering this principle from the developmental perspective, it is predicted that in actual language acquisition process, the child would start out with the most restrictive values of the GCP and the PAP, and then switch to the appropriate L1 values, if there is evidence to the contrary. Thus, in the process of Korean-speaking children's acquisition of reflexives, we may expect a stage in which they bind Korean reflexives within the nearest clause. In terms of Korean learners' L2 acquisition of English reflexives, assuming the operation of the Subset Principle, it is expected that Korean learners would correctly bind English reflexives within the nearest clause from the beginning. With respect to the PAP, if the Subset Principle works in L2 acquisition, Korean learners of English would only allow subjects as the antecedents of English reflexives.

CHAPTER 3
PREVIOUS STUDIES

The binding principles are assumed to be universal, with parametric variation. In terms of children's language development, then, it is expected that children will show command of the binding theory as soon as they have learned the lexical properties of anaphors, pronouns and R-expressions. This is because the binding theory itself is assumed to be part of the innate endowment that the child brings to the language acquisition task. Some studies have confirmed this, but others have found that children still violate binding principles even after they have mastered the relevant lexical items. In particular, a number of studies designed to test children's knowledge of Principles A and B concluded that children had knowledge of Principle A but not B. With respect to the issue of the Subset Principle effect in children's acquisition of long-distance anaphors, experimental results are controversial. While the results from Korean seem to support the Subset Principle effect, the results from Icelandic do not seem to support it. In terms of second language acquisition of English reflexives, the issue of the Subset Principle effect and of the availability of UG to adult L2 learners have been central topics of investigation. In this chapter, all these issues will be examined. The purpose of this chapter is to review previous studies on first and second language acquisition of binding, summarizing and comparing the conclusions of these studies.

First Language Acquisition of Binding Theory

Wexler and Chien(1985)

In this paper, Wexler and Chien (1985) investigate aspects of the development of major properties of reflexives and pronouns. According to the principle from the theory of Government-Binding (Chomsky 1981), a reflexive has three crucial structural properties:

(A.1) A reflexive must have an antecedent in the sentence.
(A.2) The antecedent must be in a particular structural configuration (must "c-command" the reflexive).
(A.3) The antecedent must be local.

Pronouns have properties differing from those of reflexives: a pronoun may not have a local c-commanding antecedent.

In study one, Wexler and Chien tested 129 English-speaking children from 2;6 (years;months) to 6;6 of age. The subjects were divided into eight groups of six-month intervals according to their ages. Each child was tested with sentences like those in (1), in a picture-identification task.

(1) a. Cinderella's sister points to herself.
b. Cinderella's sister points to her.

In the picture-identification task, one of the pictures matched the story related to the pronoun sentence; the other one matched the story related to the reflexive sentence. The child was asked to point to the picture which tells the story that he/she heard. In this study, Wexler and Chien measured children's coreference judgments between the reflexive or pronoun and its potential antecedents. The results showed that children's correct responses to the reflexive sentences grew from the 50% chance level to a level of about 90% correct by 6;6, whereas their correct responses to the pronoun sentences did not increase in the same rate as to the reflexive sentences.

In study two, Wexler and Chien tested 124 children in the same age range as in the first study, using the same task. The sentences tested were like those in (2):

(2) a. The sister of Cinderella points to herself.
b. The sister of Cinderella points to her.

As in study one, children's correct responses to the reflexive sentences increased to about 82% by 6;6, while their correct responses to the pronoun sentences stayed around 60% and increased to only about 70% for the oldest children. In both study one and study two, it was demonstrated that children older than 5;6 know that the antecedent must c-command the reflexive.

In study three, Wexler and Chien tested 156 children with sentences like those shown in (3), by using an act-out task similar to the "Simon-says" game.

(3) a. Kitty says that Sarah should point to herself.
    b. Kitty says that Sarah should point to her.
    c. Snoopy says that Adam should point to himself.
    d. Snoopy says that Adam should point to him.

In the test sentences, Sarah was replaced by the name of the girl who was tested; Adam was replaced by the name of the boy who was tested. In the act-out task, two puppets (one male and one female) were presented to the child. The experimenter read a test sentence to the child and the child was asked to perform an action whenever he/she heard "Kitty says or Snoopy says". The results showed that children's correct responses to the reflexive sentences grew from 20% to about 90%, whereas their coreference judgments between the pronoun and the non-local c-commanding antecedent stayed between 64% and 78%. This study demonstrated that children older than 5;6 know that the antecedent of the reflexive must be local.

Wexler and Chien argue that the fact that there is a steady increase in children's correct responses to the reflexive sentences does not mean that the younger children do not know Principle A. As an explanation for this fact, Wexler and Chien propose the Lexical Learning Hypothesis according to which only lexical items have to be learned. Principles A and B are part of what the child brings to the language learning task, but, for example, the child has to learn that herself is an anaphor and her is a pronoun. Thus, the increase in performance reflects the fact that lexical learning must take place.

Pronouns are problematic for the Lexical Learning Hypothesis, since even the oldest children showed large numbers of violations of Principle B. In addition, there was little improvement as children grew older. One possibility might be that children think pronoun is an anaphor, as suggested by Jakubowicz (1984). However, Wexler and Chien reject this explanation for two reasons. First, children at around the age of 3-4 have the free use of the pronoun. Second, in their experiments, the children did not treat pronoun as an anaphor. In other words, the children did not respond incorrectly to pronouns as often as they responded correctly to anaphors. Given these, children must know that him and her are pronouns.

To account for the pronoun data, Wexler and Chien consider two other possibilities. The first one is the possibility that Principle B is itself learned. But this answer is rejected on learnability grounds: given the lack of negative data, it is difficult to imagine how Principle B could be learned. Moreover, there is no particular reason that Principle B should be learned, while Principle A is not. The second possibility is to reformulate Principle B. Wexler and Chien argue that only pronouns as bound variables (e.g., him in "Every bear says that Kitty should give him a pencil") are subject to Principle B, following Montalbetti and Wexler (1985). According to Wexler and Chien, the reason that children did not show good knowledge of Principle B is that they have not learned a pragmatic principle[1] that rules out local binding of pronouns when pronouns are referential. This hypothesis predicts that if the pronoun is a bound variable, children at age 6 should not show violations of Principle B.

Although Wexler and Chien's proposal is interesting, this proposal runs counter to the standard version of the binding theory. In addition, if bound variable pronouns are subject to

---

[1] Pronouns can be used coreferentially without being coindexed. Adults sometimes allow two noncoindexed NPs to be coreferential, when clear pragmatic or contextual informations are available to them. This is illustrated below.

A. That must be John. He looks like him.
B. That$_i$ must be John$_j$. *He$_i$ looks like him$_i$.
C. That$_i$ must be John$_j$. He$_i$ looks like him$_j$.

The representation given in B is ruled out by Principle B, and C is the right representation for A. In C, he and him can be coreferential. Wexler and Chien (1990) argue that children do not have a pragmatic principle that governs the choice between coreferential and noncoreferential interpretations for two syntactically noncoindexed NPs. That is, children do not know that the coreferential usage is restricted to certain pragmatic contexts.

Principle B and referential pronouns are not subject to Principle B, any similarity between them, for example, the fact that both kinds of pronouns require nonlocal antecedents, cannot be accounted for.

Crain and McKee (1985)

Some studies (Tavakolian, 1978; Solan, 1983) proposed that children avoid all cases of backward coreference, i.e., coreference between a pronoun and a following R-expression, and that the prohibition against backward coreference is due to a linear rule which is based on precedence. In this study, Crain and McKee argued against this proposal and demonstrated that children's grammar is structure-dependent. If children are sensitive to a structural constraint on coreference, they will not allow backward coreference only when a pronoun c-commands an R-expression. Consider the following examples:

(4) a. He ate the hamburger when the Smurf was in the fence.
    b. When she was outside playing, Strawberry Shortcake ate an ice cream cone.

In (4a) backward coreference is prohibited since the pronoun c-commands _Smurf_. However, in (4b) both the backward coreference and external reference are allowed since the pronoun does not c-command _Strawberry Shortcake_.

In this study, Crain and McKee used a truth value judgment task. In the truth value judgment task, one experimenter acted out a situation with some toy figures and props, and a second experimenter manipulated a puppet, Kermit the frog. Following each event, Kermit said what he thought had happened on that trial. The child's task was to indicate whether or not the sentence uttered by Kermit accurately described the event. The child was asked to feed Kermit a cookie, if Kermit said what really happened, or a rag, if Kermit was not paying attention and said the wrong thing. In this task, children judged the same sentence twice, once following a situation corresponding to the backward anaphora interpretation and once following a situation corresponding to the extrasentential interpretation.

What Crain and McKee found was that children as young as 2 to 3 years accepted the backward anaphora interpretation in sentences like (4b) 73% of the time. In addition, children rejected the backward anaphora interpretation in sentences like (4a) 88% of the time, which suggests that children know Principle C of the binding theory. On the basis of these findings, Crain and McKee argued that children have knowledge of the structural constraint on backward anaphora.

Deutsch, Koster and Koster (1986)

Deutsch, Koster and Koster (1986) investigated how Dutch children from six to ten years of age interpret sentences containing anaphors or pronouns. Three groups of children (ages six, eight, and ten years) listened to sentences like those in (5) and were asked to choose from four pictures the one that agrees best with the sentence.

(5) a. De broer van Piet wast zich.
'The brother of Piet washes himself'
b. De broer van Piet wast hem.
'The brother of Piet washes him'
c. Piet z'n broer wast zich.
'Piet's brother washes himself'
d. Piet z'n broer wast hem.
'Piet's brother washes him'

To test the effect of linear order of the antecedents, two types of constructions (the prepositional van and the possessive z'n) were used. The four-picture array was composed so that only one of the four pictures was the correct choice. The other three pictures depicted interpretations of the test sentence that deviated in a particular way from the test sentence and were thus incorrect choices. One picture showed a situation in which the actor was the correct one in the sentence, but the action (reflexive vs. nonreflexive) did not agree, i.e., pronoun error. Another picture showed the opposite deviation, in which the action but not the actor was the same as in the sentence, i.e., antecedent error. The final picture agreed with the sentence neither in the type of action nor in the actor, i.e., pronoun and antecedent error.

The results were as follows. First, six-year-olds made the correct choice with each type of anaphora with approximately equal frequency (53% for reflexive vs. 54% for pronoun), while both the eight- and ten-year-olds performed better with the reflexives than they did with pronouns (from 87 to 91% for reflexive vs. from 71 to 81% for pronoun). With regard to these results, Deutsch et al. mention that for all ages and both sentence types, the percentages of correct responses were higher than would be expected if the children were performing at chance level. (Since there were four choices for each sentence, the probability of making the correct choice by chance was 25%). Second, in terms of the influence of the syntactic form of the sentence subject on the resolution of anaphora, it was found that in all three age groups, the percentages of correct responses were higher when the sentence subject was the prepositional van construction than when the possessive z'n construction was used. Third, with respect to the error responses, the antecedent error type occurred much more frequently than pronoun or mixed errors and it persisted the longest in the acquisition process, although all three error types become less frequent with increasing age. This analysis of the errors suggested that only a small part of the incorrect responses to both types of anaphora could be explained in terms of insufficient command of the lexicon and the main source of errors was problems in the correct determination of coreferential relations by the children.

On the basis of the findings of this experiment, Deutsch et al. concluded that there is no indication that the resolution of the two types of anaphora occurs in separate, sequential phases in acquisition: the crucial difference lies only in the rate of acquisition. Deutsch et al. speculated two reasons why children might learn reflexive anaphoric relations more easily than nonreflexive anaphoric relations. First, reflexive anaphoric relations are deterministic, while nonreflexive relations are not. Second, refelexive anaphoric relations are unifunctional, while nonreflexive relations are multifunctional (allowing both sentence-internal and -external reference). These observations suggest that children's low performance on Principle B relative to Principle A may be attributed to performance factors such as task demands rather than to lack of knowledge of Principle B.

Kaufman (1988)

Kaufman investigated 60 English-speaking children's knowledge of Principle B of the binding theory. The children were divided into two age groups. The younger group ranged in age from 2;7 to 3;11 and the older group ranged in age from

5;0 to 6;5. The test consisted of a truth-value judgment task and a controlled interview. In the truth-value judgment task, the child watched the first experimenter's enactment, listened to Kermit's description of the act-out (The second experimenter manipulated Kermit), and then gave Kermit a cookie if Kermit said what had really happened, or a rag if Kermit did not say what had really happened. Half of the test sentences were presented after the "transitive action" in which the animal or doll acted on another animal or doll, and the other half of the test sentences were presented after the "reflexive action" in which the animal or doll acted on herself or himself. Since all of the test sentences (8 simple sentences and 8 complex sentences) referred to the recipient of the action as him or her, half of the sentences described the enactment correctly and half did not. Test sentences contained a referential antecedent or a quantified antecedent. Following each truth-value judgment, the child was interviewed. Consider the following example. The descriptions in parentheses are of the act-outs and the child's cookie/rag responses.

(6) Experimenter 1: "The man sees the monkey fall." (Man under tree. Monkey falls on man. "Bump, bump.")
Experimenter 2: "The monkey bumps him."
Child: "Yes." (Correctly gives cookie)
Interview:

Experimenter 1: "Did the monkey bump himself?"
Child: "No."
Experimenter 1: "Did the monkey bump him?"
Child: "Yes."

The results of the experiment are as in Table 1. The numbers in parentheses are mean percentage of correct responses to the test sentences containing a quantified antecedent.

Table 1 Mean percentage correct on truth value judgment task

Referential NP (Quantified NP)	Younger		Older	
	Simple	Complex	Simple	Complex
Accept	93 (88)	88 (82)	93 (96)	88 (87)
reject	77 (82)	56 (58)	90 (87)	64 (70)

Source: Kaufman, 1988

The results of the interview procedure also showed similar response patterns to those given above. Based on these results, Kaufman argued that children would be constrained by Principle B of binding theory in choosing an antecedent for a pronominal significantly more often than chance. Kaufman's experiment also showed that children's performance with quantificational antecedents were not significantly different from their performance with referential antecedetns.

Grimshaw and Rosen(1990)

Many studies on the acquisition of binding have shown that children do not have knowledge of Principle B until some later stage. Grimshaw and Rosen challenge this position. They argue that children indeed know the binding theory (BT), but do not reliably obey it. The main source of their argument comes from the comparison of how children respond to BT-grammatical and BT-ungrammatical sentences in a grammaticality judgment task. Grimshaw and Rosen argue that if the BT-grammatical sentences are consistently treated differently from the BT-ungrammatical sentences, this means that children indeed have the knowledge of Principle B: children do not have to obey the binding theory in order to demonstrate their knowledge of it.

Grimshaw and Rosen investigated children's knowledge of Principles B and C. In their experiment, twelve subjects from 4 to 5 years of age were tested by a truth-value judgment task. The results showed that children correctly accepted the grammatical sentences 83% of the time, whereas they accepted the ungrammatical sentences only 42% of the time for Principle B, and 38% of the time for Principle C. By analyzing the results of other studies (Solan 1983; Crain and McKee 1985; Kaufman 1988; Chien and Wexler 1990; Mcdaniel, Cairns and Hsu 1990), Grimshaw and Rosen concluded that children are able to distinguish BT-grammatical from BT-ungrammatical sentences, and thus they must know Principles B and C.

If children know Principle B, why don't they obey the binding theory consistently and why is their performance on Principle B so low relative to their performance on Principle A? Grimshaw and Rosen suggested the following reasons. First, children expect pronouns to have discourse antecedents. If there is no legitimate antecedent for a pronoun, children may violate the binding theory in order to provide one. Second, in studies in which possessive NPs inside subjects are used as alternative antecedents for the pronoun or anaphor, like that of Wexler and Chien (1985), the complexity of the possessive construction itself may lead to lowered overall performance. That is, if children misanalyze the possessive construction, construing the possessor rather than the head as the subject of the sentence, this may lead to failure to obey the binding theory. Third, certain picture identification tasks designed to test knowledge of Principle A allow subjects to perform correctly without using their knowledge of binding. In other words, a subject will always be correct just by choosing the picture depicting what Grimshaw and Rosen call a "reflexive action", not by using their knowledge of binding. This may affect the asymmetry in performance on Principles A and B.

Fourth, since emphatic pronouns are not subject to the binding theory, if children misinterpret some of the presented pronouns as emphatic, this may lower obedience to the binding theory. Fifth, if children fail to construct the bound variable reading, they will reject the picture-sentence pair. This will lead to the high performance on pronouns as bound variables relative to performance on referential pronouns.

McDaniel, Cairns and Hsu (1990)

McDaniel et al. undertook two studies. In the first study, 20 children aged from 3;9 to 5;4 were tested with sentences in (7)-(9) by using an act-out task and an interview.

(7) Sentences relevant to Principle A
    a. Grover is washing himself.
    b. Grover wants Cookie Monster to pat himself.
    c. Grover says that Cookie Monster is patting himself.
(8) Sentences relevant to Principle B
    a. Grover is washing him.
    b. Grover thinks that Cookie Monster is touching him.
    c. Cookie Monster wants Grover to wash him.
(9) Sentences relevant to Principle C
    a. He is washing Grover.
    b. Bert thinks that he is patting Grover.

c. He tells the lion that the zebra is drinking water.

d. Grover tells himn that Cookie Monster will climb the tree.

McDaniel et al. reported the results of the experiment by analyzing each child with respect to his obedience to each binding principle. First, in terms of Principle A, only four of the subjects did not obey Principle A by allowing reflexives to be free in sentences given in (7). Second, in terms of Principle B, nine of the children obeyed it and seven did not. Four showed partial knowledge by disallowing coreference in sentences (8b) and (8c) but allowing it in (8a). Third, with regard to Principle C, two of the youngest children exhibited no knowledge of Principle C and another two showed partial knowledge by disallowing coreference in sentences (9a) and (9b) but allowing it in (9c) and (9d). On the basis of these results, McDaniel et al. concluded that Principles A and C are obeyed quite early but B is violated by older children.

In the second study, McDaniel et al. tested 19 children from 2;9 to 6;7 with sentences like those in (10) and (11) by a judgment task. The purpose of the study was, first, to look into the relationship between the acquisition of Principle A and that of the emphatic reflexive, and second, to investigate Principle B further, comparing performance on the referential pronoun to performance on the pronoun that is a bound variable.

(10) a. Grover is washing himself.
b. Himself is going to school.
c. He himself is going to school.
(11) a. Grover is washing him.
b. Everyone is patting him.

McDaniel et al. hypothesized that only children who are acquiring the emphatic reflexive will both obey Principle A and accept the reflexive in subject position. That is, these children are in the process of acquiring the emphatic reflexive, but have acquired it imperfectly, lacking the requirement that it contain an initial NP. The results of the study confirmed their hypothesis. No children were found who obeyed Principle A but accepted the reflexive in subject position in sentences like (10b) and not the emphatic reflexive in sentence (10c).

With respect to Principle B, McDaniel et al. found cases where children obeyed Principle B only when the pronoun was a bound variable.

On the basis of their findings with respect to Principle A and the emphetic reflexive, McDaniel et al. hypothesized the following. When Principle A is not mastered yet, children's grammar generates sentences with reflexive in subject position. When Principle A emerges, the grammar no longer generates such sentences. Then, in the case where the emphatic reflexive is acquired imperfectly, the grammar generates them again until the emphatic reflexive is correctly formulated. McDaniel et al. also suggested that a similar phenomenon occurs in the case of Principle B too. Initially, children do not have knowledge of Principle B. Sometime Principle B emerges. Some children then lose B in cases where the pronoun is not a bound variable. This might be due to hearing sentences like "I choose me". (On hearing sentences like this, children might conclude that pronouns can be used coreferentially without being coindexed.) Finally, Children once again demonstrate knowledge of Priniciple B.

McDaniel et al. concluded that in language development grammars keep changing: sentences generated by the earliest grammars come in and out of intermediate grammars and are finally not generated by the adult grammar. They argued that the assumption that the developing linguistic system generates increasingly more complex constructions and at each developmental stage the constructions of the previous ones are properly included cannot be maintained.

Hyams and Sigurjónsdóttir (1990)

Hyams and Sigurjonsdottir reported an experimental study of the interpretation of reflexive SIG and lexical pronouns by Icelandic-speaking children. 105 Icelandic children aged from

2;6 to 6;0 were tested with sentences like those in (12) by an act-out task. All test sentences contained the verb gefa 'to give'. Test sentences included three sentence types: those with indicative, subjunctive, and infinitive complements.

(12) a. Kermit$_{i}$ segir aď Jón$_{j}$ gefi (SUB) sér$_{i/j}$ bíl.
'Kermit says that John gives SIG a car'
b. Kermit$_{i}$ segir Jóni$_{j}$ aď gefa (IND) sér$_{i/j}$ disk.
'Kermit tells John to give SIG a plate'
c. Kermit$_{i}$ sér aď Jón$_{j}$ gefur (IND) sér$_{*i/j}$ flautu.
'Kermit sees that John gives SIG a whistle'
d. Svínka$_{i}$ segir aď Sara$_{j}$ gefi (SUBJ) henni$_{*j/i/k}$ bil.
'Miss Piggy says that Sarah gives her a car'
e. Svínka$_{i}$ sér aď Sara$_{j}$ gefur (IND) henni$_{*j/i/k}$ bil.
'Miss Piggy sees that Sarah gives her a car'
f. Svínka$_{i}$ segir Söru$_{j}$ aď gefa (INF) henni$_{*j/??i/k}$ bil.
'Miss Piggy tells Sarah to give her a car'

The results of the experiment are as follows. First, in terms of the interpretation of reflexive SIG, Icelandic children consistently preferred the long-distance antecedent over the local antecedent across all sentence types, which disconfirmed the prediction of the subset principle. Second, with respect to the interpretation of lexical pronouns, Icelandic children consistently preferred the correct nonlocal antecedent, and they showed a steady increase in performance from younger to older children, reaching 90% correct across all sentence types by age 5. In order to account for the children's strong preference for the long-distance antecedent in the interpretation of reflexive SIG, Hyams and Sigurjónsdóttir assumed that the long distance verbs such as gefa have the lexical property of assigning a pronominal feature to SIG, which is otherwise a pure anaphor. They also assumed that Condition A of the binding theory is satisfied at LF, whereas Condition B is satisfied at S-structure, following Hestvik (1989). Since SIG, as a pronominal anaphor, must be locally free at S-structure and must be bound at LF, it is expected that SIG with the gefa-type of verbs takes a long-distance antecedent.

Because in Hyams and Sigurjónsdóttir's experiment, all test sentences contained the verb gefa which imposes a strong preference for a long-distance antecedent, their experimental results cannot be taken as evidence of the nonoperation of the Subset Principle.

Lee (1990)

Lee reported on an experimental study designed to examine whether the Subset Principle holds for the acquisition of long-distance binding in Korean. 90 Korean children aged from 5;1 to 8;0 were tested with four different types of sentences as in (13) by a truth-value judgment task.

(13) a. Grand Papa-ka [Piniccio-ka caki-lul karikiess-ta]-ko
NOM [NOM self-ACC pointed to-DEC]-COMP
saengakhaess-ta.
thought-DEC
'Grand Papa thought that Pinoccio pointed to self'

b. Pinoccio-ka [modun ttokki-ka caki-lul karikiess-ta]-
NOM [all rabbit-NOM self-ACC pointed to-DEC]-
ko saengakhaess-ta.
COMP thought-DEC
'Pinoccio thought that all the rabbits pointed to self'

c. modun horangi-ka [Grand Papa-ka caki-lul karikiess-
all tiger-NOM [NOM self-ACC pointed to
ta]-ko saengakhaess-ta.
DEC]-COMP thought-DEC
'all the tigers thought that Grand Papa pointed to self'

d. modun toechi-ka [modun ohri-ka caki-lul karikiess-
all pig-NOM [all duck-NOM self-ACC pointed to]
ta]-ko saengakhaess-ta.
DEC-COMP thought-DEC
'all the pigs thought that all the ducks pointed to self'

(13a) contains two referential names, either of which is a potential antecedent of the reflexive caki. In (13b) and (13c), either the matrix subject or the embedded subject is a quantified phrase. In (13b) caki can be bound by the long-distance subject, or interpreted as a variable bound by the local quantified subject. Conversely, in (13c) caki can be interpreted as a variable bound by the long-distance subject, or bound by the local subject. (13d) contains two quantified phrases, either of which is a potential antecedent of caki.

In the truth-value judgment task, children were given four pictures for each sentence and were asked to indicate whether each picture correctly represented the sentence they had heard. The first and second pictures described the local binding and the long-distance binding, respectively. In the third and the fourth pictures, incorrect actors were involved in the action of 'pointing at'.

The results of the experiment showed that the younger children at 5;6 better performed with the local antecedent than the long-distance antecedent, whereas some older children at 6;7 and 7;7 better took the long-distance antecedent than the local one. With respect to the antecedent type, i.e., referential versus quantified antecedents, no significant response differences were found. Based on the findings of the experiment, Lee argued that the Subset Principle holds for Korean binding acquisition.

Although Lee's subjects at 5;6 preferred a local antecedent over a long-distance antecedent, Lee's youngest subjects (5;1) did not prefer a local antecedent. Therefore, it is difficult to say that Lee's experimental results support the Subset Principle conclusively.

Summary

In the preceding review, a number of controversial acquisition issues were identified. First, while some studies (Hyams and Sigurjónsdóttir, 1990; Kaufman, 1988) have shown that children do have knowledge of both Principle A and B, other studies (Wexler and Chien, 1985; Deutsch et al., 1986) have concluded that Principle B compared to Principle A is developed later. Second, with respect to Principle C, some studies (Crain and McKee, 1985; McDaniel et al., 1987) have demonstrated that children master Principle C early like the case of Principle A. However, Grimshaw and Rosen's results showed that children failed to obey Principle C some significant percentage of the time. Third, concerning the issue of bound variable readings versus referential readings for pronouns, some studies (McDaniel et al., 1990; Chien and Wexler, 1990[2]) have found children's high performance on pronouns as bound variables relative to performance on referential pronouns, whereas others (Kaufman, 1988) have found no difference in performance between the two. Fourth, the studies that investigated the development of long-distance reflexives addressed the issue of the Subset Principle. While some studies (Lee, 1990) have concluded that the Subset Principle operates in children's acquisition of binding, others (Hyams and Sigurjónsdóttir, 1990) have concluded that this is not the case. In the following chapter, all these issues will be discussed with respect to Korean-speaking children's acquisition of binding.

---

[2] Chien and Wexler (1990) is not reviewed in this chapter. Chien and Wexler reported on an experimental study designed to examine children's knowledge of Principles A and B. In this study it was shown that children better performed with pronouns as bound variables than with referential pronouns. Chien and Wexler concluded that children know the grammatical principles of binding but do not know a relevant pragmatic principle.

Second Language Acquisition of Reflexive Binding

Finer and Broselow (1986)

Finer and Broselow reported on a pilot study on the second language acquisition of English reflexives by six adult Koreans. Subjects were students in an intensive English program at a university in the USA. The experiment involved a picture identification task. Subjects were shown pairs of pictures and were given a sentence. They were then asked to indicate which of the two pictures was appropriate for the sentence they had heard or if both pictures represent the sentence. Among sixteen test sentences, half contained reflexives. Examples of the types of the sentences used in the experiment are shown below:

(14) a. Mr. Fat thinks that Mr. Thin will paint himself.

b. Mr. Thin asks Mr. Fat to paint himself.

Finer and Broselow's results are as in Table 2:

Table 2 The Percentage of responses in tensed and infinitive clauses

	Local	Nonlocal	Either
Tensed Clause	91.7	8.3	0
Infinitive Clause	58.3	37.5	4.2

Source: Finer and Broselow, 1986

Table 2 shows that while subjects correctly chose the local antecedent in the tensed clauses (over 90% of the responses), they often failed to do so in the infinitive clauses. Finer and Broselow interpreted this result as indicating that subjects were assuming a value for the Governing Category Parameter which is somewhere between the (a) value (English) and the (e) value (Korean), possibly (c) (Russian). This is because the tensed/infinitival distinction is irrelevant to the distribution and interpretation of reflexive anaphors in both Korean and English. Finer and Broselow concluded that Korean learners of English had come up with a set of binding principles that is consistent with the parameters provided by

UG, but inconsistent with either the first or the second language.

Finer and Broselow provided another interpretation of the results in terms of the Subset Principle. The results from the tensed clauses support the operation of the Subset Principle. However, the results from the infinitive clauses are inconsistent with the operation of the Subset Principle. To account for the differences in responses between the tensed clauses and the infinitive clauses, Finer and Broselow suggested the possibility that Korean learners of English misanalyzed the subject of the infinitive as the direct object of the matrix verb. That is, Korean-speaking learners may consider the subject of the infinitive as the direct object of the matrix verb and avoid it as the antecedent because of the Proper Antecedent Parameter (The unmarked value of the Proper Antecedent Parameter is defined to be a subject). If this is indeed the case, it can be argued that the Subset Principle fully operates in second language acquisition: the learners, assuming the most unmarked value for the Governing Category Parameter and for the Proper Antecedent Parameter, preferred the local interpretation in the tensed clauses and the nonlocal interpretation in the infinitivals.

Thomas (1989)

Thomas investigated whether second language learners know the following facts about the interpretation of English reflexives (p. 283):

(15) a. The Clause Mate Condition
In a finite clause, a reflexive pronoun must find an antecedent within the minimal dominating S-node.
b. The Subject Strategy
A reflexive is usually identified with a subject rather than a non-subject NP in an ambiguous context.

96 second language learners of English were presented with 30 sentences like those in (16) and were required to identify the antecedent of a reflexive pronoun by circling one of three multiple-choice answers. (For example, in case of sentence (16a), a subject may choose either (a) Bill, (b) David, or (c) Either Bill or David.)

(16) a. David could see that Bill was looking at himself in the mirror.
b. Mary angrily told me that Sue had spilled a lot of paint on herself.
c. Susan gave Mary three photographs of herself taken last summer.
d. After the medical test were completed, the doctor informed Bill about himself.

Sentences like (16a) and (16b) were constructed to investigate the subjects' knowledge of the clause mate condition in a coreference neutral context and a non-local antecedent pragmatically favored context, respectively. Sentences like (16c) and (16d) were presented to see if the subject strategy holds in a neutral context and a non-subject favored context, respectively.

The results of the experiment showed that, first, second language learners as a group do not fully obey the clause mate condition, regardless of the existence of pragmatic bias; second, second language learners and native speakers of English responded similarly to sentences like (16c) and (16d) by choosing the subject NP in a coreference neutral context and the non-subject NP in a non-subject NP favored context.

To see whether second language learners transfer the rules of L1 to L2, Thomas compared responses of native speakers of Spanish (29 subjects) with those of native speakers of Chinese (24 subjects) to the test sentences. Since Spanish allows only antecedents in the same clause, whereas Chinese allows non-local antecedents, it is expected that Chinese speakers make more mistakes than Spanish speakers. However, no difference between Spanish and Chinese speakers' responses was found with respect to the clause mate condition. That is, both groups allowed long-distance binding of reflexives. The following shows mean percentages of responses in bi-clausal finite sentences:

Table 3 Mean percentages of responses in bi-clausal finite sentences: coreference neutral

	Spanish L1 (n=29)	Chinese L1 (n=24)
Non-local	18.90	7.29
Local	59.48	69.04
Either	21.14	23.46

Source: Thomas, 1989

Applying Wexler and Manzini's parameter-setting model of L1 acquisition to L2 acquisition, Thomas concluded that the Subset Principle does not operate in L2 acquisition, since the non-local responses are inconsistent with the subset value of the Governing Category Parameter. She also concluded that transfer of the grammar of L1 cannot account for the non-local responses of native speakers of Spanish, while this is possible for the Chinese. With respect to the Proper Antecedent Parameter, the fact that most of the subjects allowed both subject and non-subject antecedents in single clause sentences suggested that second language learners may successfully reset the Proper Antecedent Parameter to its marked value.

Hirakawa (1990)

Hirakawa investigated how native speakers of Japanese learning English in Japan acquire syntactic properties of English reflexives and the effects of two parameters of UG, the Governing Category Parameter (GCP) and the Proper Antecedent Parameter (PAP). With respect to the GCP, English represents the most unmarked value while Japanese represents the most marked one. Thus, if the Subset Principle operates in L2 acquisition, Japanese learners of English will correctly choose local antecedents in bi-clausal sentences by resetting the GCP back to its unmarked value. With reference to the PAP, if learners reset the parameter to its marked value, they will allow both subject and non-subject antecedents in single clausal sentences, since English represents the marked value in this case.

65 native speakers of Japanese in Grades 10,11,12, and 13 (ages 15 to 19 years) were tested with sentences like those in (17). Subjects were required to choose the antecedent of the reflexive in each sentence by circling one of a set of given choices.

(17) Type A: Two-clause sentence (finite)
John said that Bill hit himself.
Type B: Three-clause sentence (finite)
Mary remembers that June said that Alice blamed herself.
Type C: Two-clause sentence (infinite)
Mary asked Ann to introduce herself.

Type D: Three-clause sentence (infinite)

Ann knows that Mary told June not to hate herself.

Type E: One-clause sentence

Bob talked to Paul about himself.

Results showed that the Japanese learners of English could not set the value of the GCP correctly; they set the widest value, allowing non-local antecedents for the reflexive even in tensed clauses. This could be explained in terms of transfer of the L1 value. Thus, the Subset Principle does not seem to operate in L2 acquisition. With respect to the difference between the finite and infinite clauses in responses, the finding is consistent with that of Finer and Broselow (1986). Reflexives in infinitial clauses received more non-local responses than reflexives in finite clauses, as seen in Table 4:

Table 4 Mean percentages of responses in two types of clauses

	Finite (Type A)	Infinite (Type C)
Non-local	17.13	36.45
Local	76.95	55.14
Either	5.92	7.79

Source: Hirakawa, 1990

Finer and Broselow (1986) argue that L2 learners set the GCP to an intermediate value, allowing non-local antecedents in infinite clauses but disallowing them in finite clauses. Hirakawa's result is inconsistent with this, since her subjects made a large number of mistakes in Type A sentences.

With respect to the PAP, Hirakawa reported the similar results to those of previous studies. The Japanese learners of English correctly set the value of the PAP to the superset English value, allowing both subject and non-subject antecedents in one-clause sentences.

Although the majority of L2 learners failed to set the correct value of the GCP, some successful learners responded 100% correctly. On the basis of this, Hirakawa concluded that parameter resetting is possible, at least for some learners.

Summary

If the Subset Principle operates in L2 acquisition, second language learners of English should consistently choose the local antecedent of a reflexive. However, as we have seen, the studies which investigated the second language acquisition of English reflexives by nonnative speakers have not provided evidence for the operation of the Subset Principle in L2 acquisition.

The results of the studies also suggest that L2 learners' responses cannot be explained solely by L1 transfer. Spanishspeaking subjects in Thomas (1989) and Korean-speaking subjects in Finer and Broselow (1986) did not treat English like Spanish and Korean, respectively.

As for the question of what value of the Governing Category Parameter L2 learners adopt, there is no agreement among studies. While Finer and Broselow's (1986) results suggest the intermediate value, the results of Thomas (1989) and Hirakawa (1990) suggest the widest value.

Another interesting question raised with reference to second language acquisition of English reflexives is whether UG is available to adult second language learners. The fact that the Subset Principle is not operative in L2 acquisition does not imply that UG is inaccessible to second language acquisition since the Subset Principle as a learning principle is independent of UG. As a matter of fact, the studies have shown that none of the subjects' responses was incompatible with a grammar of a natural language.

As to whether parameter resetting is possible in second language acquisition, the studies do not provide a conclusive answer although Hirakawa (1990) suggested that "parameter resetting appears to be possible at least for some learners" (p. 81).

In Chapter 5, all these acquisition issues raised by the previous studies will be investigated further by examining Korean adult learners' acquisition of English reflexives.

CHAPTER 4
KOREAN CHILDREN'S ACQUISITION OF BINDING

As seen in the last chapter, many issues concerning children's knowledge of the binding principles remain unsettled. The cross-linguistic experiments revealed controversial findings concerning the children's acquisition of binding.

The goal of this chapter is to investigate further three key questions relevant to the acquisition of binding. First, is Principle B less available to children early in their grammatical development than Principle A? Second, is Principle C respected by young children as early as Principle A? Finally, does the Subset Principle operate in children's acquisition of long-distance anaphors?

The present chapter reports on four experiments on the acquisition of binding by children acquiring Korean. The first three experiments investigate Korean children's knowledge of the binding principles A, B and C, respectively. The fourth experiment examines the Subset Principle effect in the acquisition of the long-distance anaphor caki in Korean.

Choosing a Task

In all four experiments, the Yes/No Judgment task devised by Chien and Wexler (1990) was used to elicit children's grammaticality judgments of sentences containing reflexives or pronouns. In the Yes/No Judgment task, the child was presented with a cartoon picture, an introductory sentence, and a target sentence related to the picture. After a careful inspection of the picture, the child was asked to decide if the target sentence correctly described what had happened in the picture. Since previous studies (Crain and Mckee, 1985; McKee, 1988) revealed that children were reluctant to say that something an adult had said was wrong, the subjects were not asked to say "yes" or "no" to the experimenter. Instead, they were instructed to draw "O" on paper if a sentence-meaning pair is true, or "X" if a sentence-meaning pair is false. The subjects were also instructed to draw Δ when they could not understand the sentence.[1] Because children like drawing, this procedure was found to be fun for the subjects.

Crain and McKee (1985) noted that act-out tasks using ambiguous sentences could not reveal the complete set of interpretations children's grammar allows: act-out tasks could only indicate what the child's preference is. In this respect, grammaticality judgment tasks seem to be a more accurate way of assessing children's grammatical knowledge. In the grammaticality judgment task, it is possible to elicit the child's judgment of different interpretations of the same sentence by presenting the child with one context and one sentence at a time.

---

[1] Since the youngest of my subjects were 4-year-olds, and Korean children are accustomed to using O/X procedure, this task was not complex for the children.

The Acquisition of Binding Principles

Method

Subjects. Subjects were 102 Korean-speaking children ranging in age from 4;1 to 9;0 and 20 adults. About equal numbers of boys and girls (54 boys and 48 girls) took part in the experiment. Their participation in the experiment was voluntary. The child subjects were randomly selected through kindergartens and elementary schools in Ili, Korea. The child subjects were divided according to their ages into 5 groups of one-year intervals (Group 1: from 4;1 to 4;11 (mean age 4;6), Group 2: from 5;1 to 6;0 (mean age 5;5), Group 3: from 6;2 to 7;0 (mean age 6;7), Group 4: from 7;1 to 8;0 (mean age 7;6), Group 5: from 8;1 to 9;0 (mean age 8;6)). The adult subjects were a random sampling of students attending a college in Ili, Korea. The same 102 children and 20 adults participated in all three experiments.

Procedure. Each child was seen individually in an empty classroom for three sessions of about 20 to 30 minutes each.

In the first session, the Yes/No Judgment task was introduced. The child was then given practice sentences. After each practice sentence, the experimenter explained why the sentence-picture pair was true or false. The child was also encouraged to explain why he/she drew O or X. During the practice period, the child was trained to be accustomed to the O/X procedure. The practice sentences consisted of two simple sentences (e.g., "Is the rabbit sleeping?") and two complex sentences (e.g., "The bear thinks that the rabbit is playing the piano"). Both declarative and interrogative sentences were included since both types of sentences appear in the actual test.[2] Among four practice sentences, two were false and two were true. Following the practice period, the child was given a pretest. The pretest was composed of three sentences, two of which were false and one of which was true. Only the children who had correctly answered all three pretest sentences in a row were included in the experimental groups. Of the children pretested, 16 failed. The pretest sentences are listed in Appendix A.

The children were then given the actual test. The target sentences for Principles A, B and C were given in the first, second, and third session, respectively. No feedback was given to the children on their performance during these sessions. Each test sentence was given two times in each context, and each child was allowed as much time as desired to respond. Throughout the test sentences, two popular Korean male names Inchel and Dongswu, and two popular Korean female names Yenglan and Sena were used.

---

[2] In order to make the test sentences sound as natural as possible, some of them were given in a declarative form and the others in a interrogative form.

In addition to the test sentences, each experiment also included three filler sentences. These sentences served as a check on whether the children were paying attention to the task. The filler sentences are given in Appendix C.

Experiment for Principle A

This experiment was designed to investigate children's knowledge of Principle A. Thus, the target sentences included Korean anaphors caki 'self', cakicasin 'self' and selo 'each other'.

Materials. The target sentences and the corresponding pictures used in this experiment are given below:

(1) a. ikes-un thokki-i-ko ikes-un kom-ipni-ta.
this-TOP rabbit-be-COMP this-TOP bear-be-DEC
thokki-nun caki-lul kalikhi-koiss-nayo?
rabbit-TOP self-ACC point at-ING-Q
'This is a rabbit and this is a bear. Is the rabbit pointing at himself?'
b. i salam-un Yenglani-i-ko i salam-un
this person-TOP Yenglan-be-COMP this person-TOP

Yenglan-uy emma-ipni-ta. Yenglani-uy emma-nun
Yenglan-GEN mother-be-DEC Yenglan-GEN mother-TOP
caki-lul kalikhi-koiss-nayo?
self-ACC point at-ING-Q
'This is Yenglan and this is Yenglan's mother. Is Yenglan's mother pointing at herself?'

c. kom-i wul-koissul-ttay thokki-nun caki-lul
bear-NOM cry-ING-when rabbit-TOP self-ACC
mancyessupni-ta.
touched-DEC
'While the bear was crying, the rabbit touched himself.'

d. thokki-nun kom-i cakicasin-ul kalikess-ta-ko
rabbit-TOP bear-NOM self-ACC pointed at-DEC-COMP
malhayssupni-ta.
said-DEC
'The rabbit said that the bear pointed at himself.'

e. komtul-un thokkitul-i selo-lul kalikhyess-ta-
bears-TOP rabbits-NOM each other-ACC pointed at-DEC-
ko saykakhayssupni-ta.
COMP thought-DEC
'The bears thought that the rabbits pointed at each other.'

f. thokki-nun kom-eykey caki-uy sacin-ul
rabbit-TOP bear-DAT self-GEN picture-ACC
poyecu-koissupni-kka?

show-ING-Q

'Is the rabbit showing the bear a picture of himself?'

Wexler and Chien (1985, p.138) listed three crucial structural properties of a reflexive as follows:

(2) a. A reflexive must have an antecedent in the sentence.
    b. The antecedent must be in a particular structural configuration (must "c-command" the reflexive).
    c. The antecedent must be "local"

Sentence (1a) was included to test children's knowledge of property (2a). To demonstrate knowledge of (2a), the child must reject the extrasentential interpretation of (1a). Sentence (1b) aimed to test property (2b). Since Yenglan does not c-command caki, the only possible antecedent of caki is Yenglan's mother. Sentence (1c) was included to assess children's knowledge of property (2c), that is, "the locality condition" of a reflexive. A child can demonstrate knowledge of (2c) by correctly rejecting the extraclausal interpretation of caki in (1c).[3] Sentence (1d) includes another type of reflexive cakicasin. This reflexive can take only a local c-commanding antecedent, so the bear is the only possible

---

[3] In complex sentences with embedded clauses, caki can take extraclausal antecedents. That is, any c-commanding subject can serve as an antecedent of the reflexive caki as far as it is within the main clause. Thus, this type of sentences was not included in this experiment.

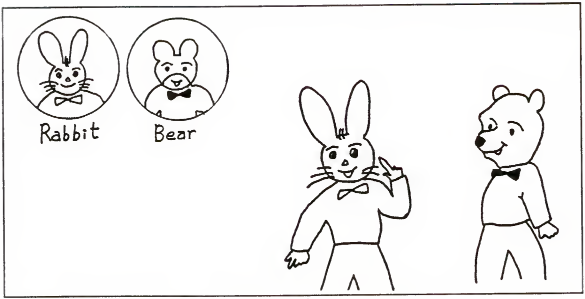


Figure 5 (1a) The Match Condition

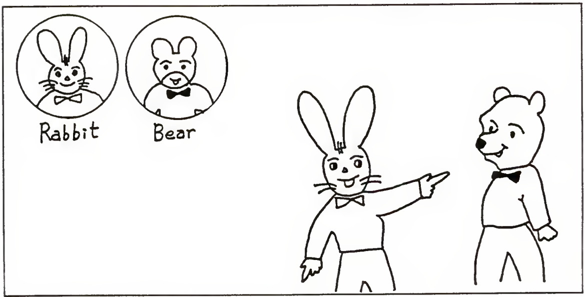


Figure 6 (1a) The Mismatch Condition

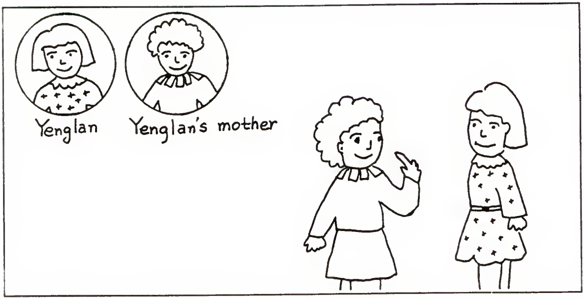


Figure 7 (1b) The Match Condition

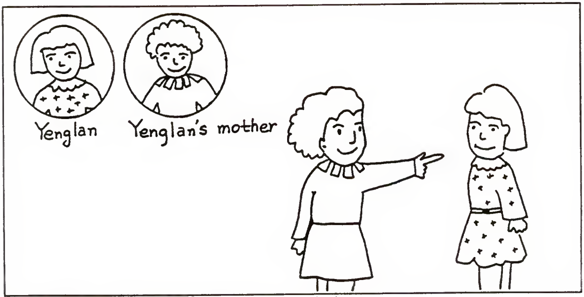


Figure 8 (1b) The Mismatch Condition

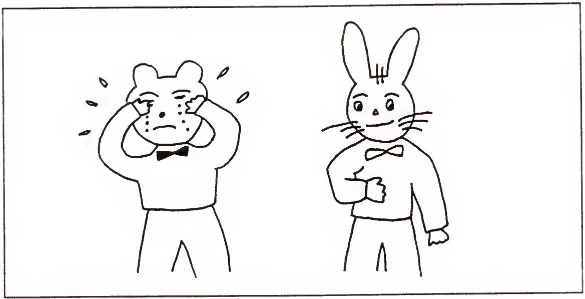


Figure 9 (1c) The Match Condition

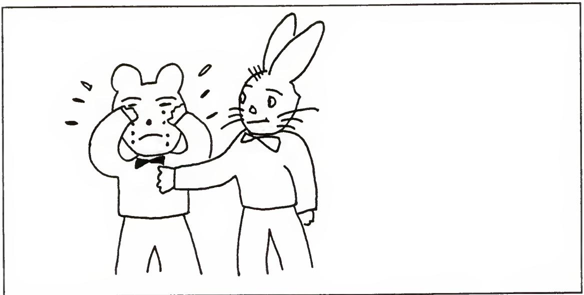


Figure 10 (1c) The Mismatch Condition

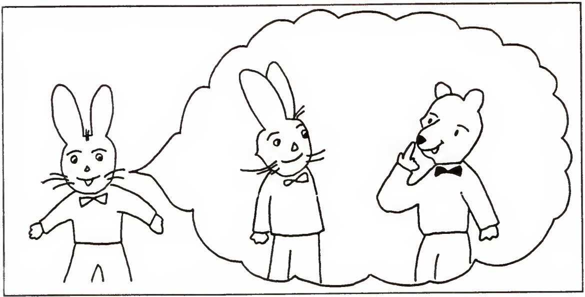


Figure 11 (1d) The Match Condition

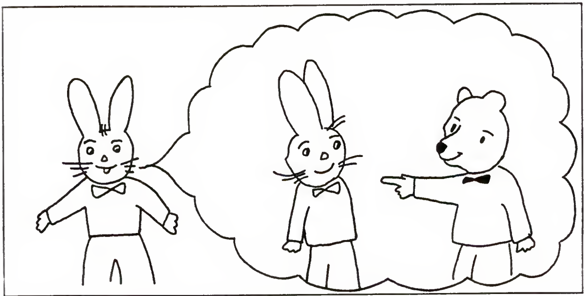


Figure 12 (1d) The Mismatch Condition

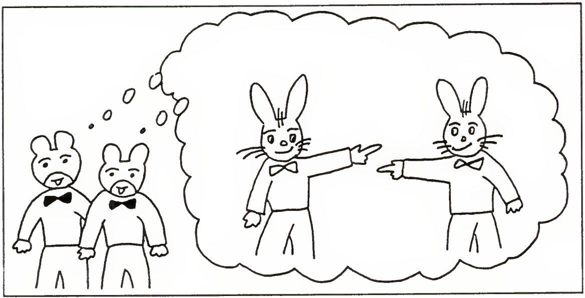


Figure 13 (1e) The Match Condition

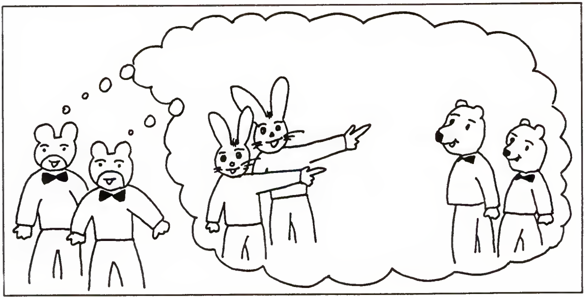


Figure 14 (1e) The Mismatch Condition

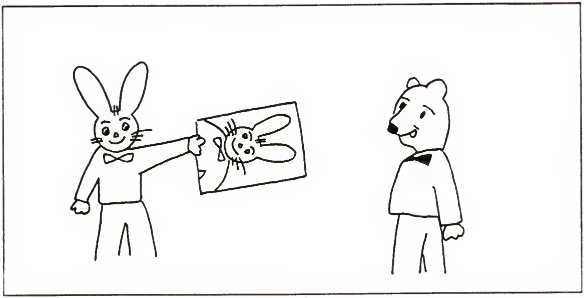


Figure 15 (1f) The Match Condition

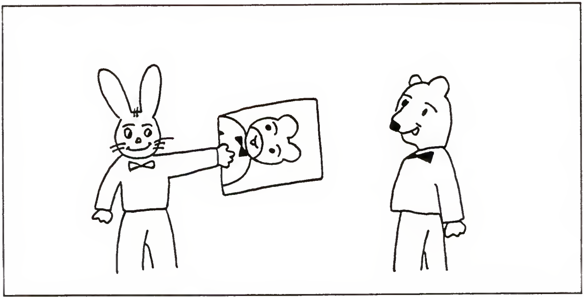


Figure 16 (1f) The Mismatch Condition

antecedent. Sentence (1e) includes the reciprocal selo. The antecedent of selo must be local. Thus, only the rabbits can be the antecedent of selo. The Proper Antecedent Parameter proposed by Wexler and Manzini (1987) states that languages like Korean allow only subjects as the antecedents of reflexives. Given this, in (1f) only the rabbit can serve as the antecedent of the reflexive.

Each sentence was presented twice, once with the picture which matched the sentence and once with the picture which mismatched the sentence. This resulted in a total of 12 target trials. Among these 12 trials, if the subjects followed the binding principles, they would judge 6 as true and 6 as false.

Two different verbs, kalikita 'point at' and mancita 'touch', were used in the test sentences since clearly illustrated, natural sounding sentences containing caki were easily constructed with these verbs.

Wexler and Chien (1985) argue that children who know the binding principles should perform in experiments at the level of perfection (close to 100%). However, Grimshaw and Rosen (1990) argue against this assumption, providing many reasons, quite unrelated to knowledge of binding, why children might perform below 100%. Therefore, in interpreting experimental results, I assume that if the binding principles are operative, (1) children would accept matched sentence-meaning pairs significantly more often than chance; (2) children would reject mismatched sentence-meaning pairs significantly more often than chance.

Results. The results of this experiment are summarized in Figures 17-22. These figures show, by age group, the percentages of correct responses to the sentence-meaning pairs. The line with squares shows the results of the match conditions and the line with crosses shows the results of the mismatch conditions.

Figures 17-19 indicate that the children older than 6 know three major properties of reflexives. The children's correct responses to sentences (1a) and (1c), in the match conditions, increased from about 65% (68.75% in (1a) and 62.50% in (1c)) at age 4 to perfect performance (100%) at age 7. In the cases of the mismatch condition, their correct responses increased from about 28% (31.25% in (1a) and 25.00% in (1c)) at age 4 to almost perfect performance (100% in (1a) and 95% in (1c)) at age 7. The children younger than 6 showed problems with the mismatched pairs.

In order to determine whether there are significant differences in performance across sentence types and conditions, the two factor (sentence type X condition) repeated ANOVA was conducted on children's responses to sentences.[4] Results of the ANOVA revealed significant main effects for sentence type ($F(1,101)=6.31$, $p<.05$) and condition ($F(1,101)=17.00$, $p<.001$), but no significant interaction for

---

[4] Since children's overall performance rather than performance of each group was the target of the analysis, group distinction was not made in this analysis.

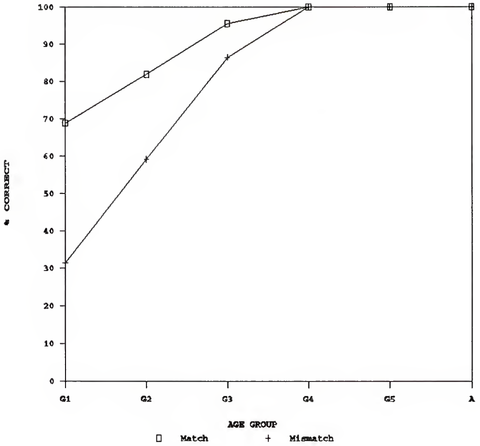


Figure 17 Percentage of Correct Responses to (1a)

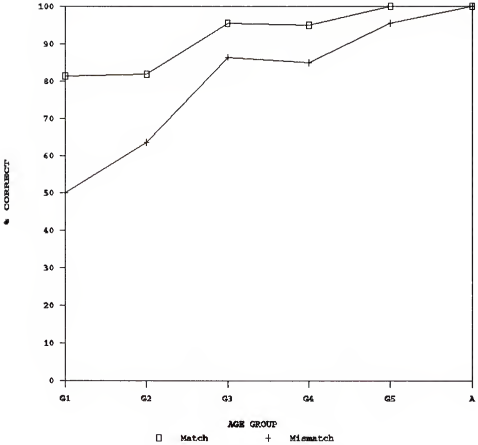


Figure 18 Percentage of Correct Responses to (1b)

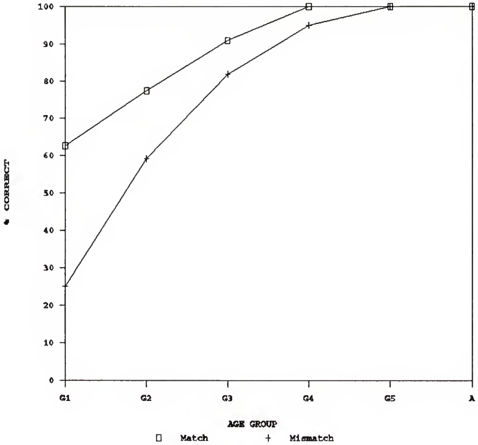


Figure 19 Percentage of Correct Responses to (1c)

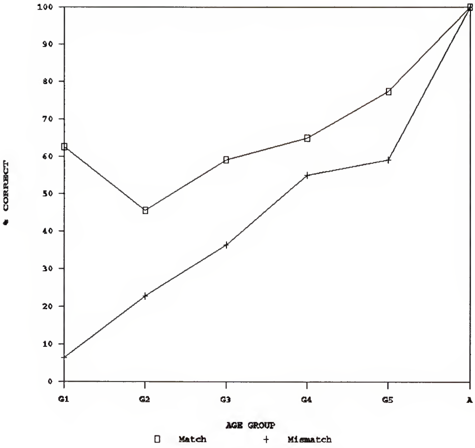


Figure 20 Percentage of Correct Responses to (1d)

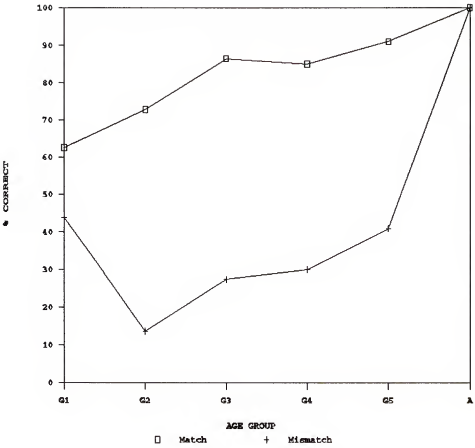


Figure 21 Percentage of Correct Responses to (1e)

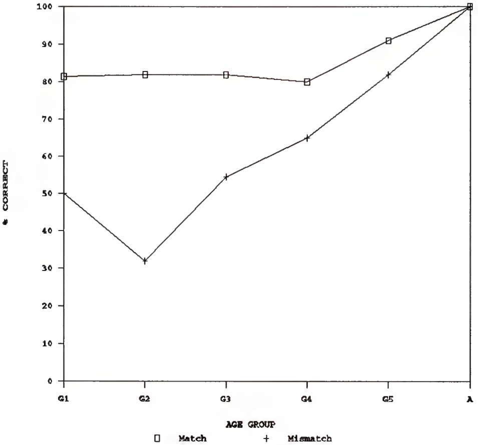


Figure 22 Percentage of Correct Responses to (1f)

sentence type X condition (F(1,101)=.00, p=1.00). In terms of the factor of sentence complexity, the children's performance with the simple sentence (1a) was significantly better than the complex sentence (1c). In terms of condition, the match condition was better performed than the mismatch condition.

The children's performance on sentence (1b) indicates that the children are sensitive to the structural relation of c-command. As Figure 18 indicates, even the youngest children tested correctly accepted the matched sentence-meaning pair more than 80% of the time. In the case of the mismatch condition, the children's correct responses increased from the 50% chance level for the youngest to a level of 95% correct for the oldest.

The analysis of individual children's responses revealed that as children's age increased, more children gave 100% correct responses to sentences (1a), (1b) and (1c) : 3(G1), 13(G2), 18(G3), 19(G4) and 21(G5).

Figures 20 and 21 indicate the children's correct responses to the sentences containing the reflexive cakicasin and the reciprocal selo, respectively. As shown in the figures, the children did not perform well with these sentences. Their correct responses to these sentences did not increase at the same rate as to sentences containing the reflexive caki, although a continuous improvement in their performance on these sentences was observed. In the mismatch conditions, even the oldest children correctly rejected the sentence-meaning pairs only at the chance level (59.1% for (1d) and 40.91% for (1e)), and the children gave "Do not know" responses about 15% of the time, with the exception of the youngest. The youngest children's different response patterns from the other groups' response patterns might be due to their responses based on a simple guessing process.

Figure 22 indicates that Korean children at age 8 correctly allow only the subject as the antecedent of the reflexive _caki_. In the match condition, the children in all age groups correctly responded "yes" more than 80% of the time (90.91% for the oldest). In the mismatch condition, the children's correct responses grew from the 50% chance level to a level of about 82% correct.

The children's responses to the filler sentences were correct 82% of the time. This clearly shows that the children did not perform randomly.

Experiment for Principle B

This experiment was designed to test children's knowledge of Principle B, which concerns the binding of pronouns. Thus, Korean pronouns _ku_ 'he' and _kunye_ 'she' were included in the target sentences.

Materials. The target sentences and the corresponding pictures used in this experiment are as follows:

(3) a. thokki-nun swuphsok-eyse kom-ul mannassumni-ta.
rabbit-TOP forest-in bear-ACC saw-DEC
kom-un ku-lul kalikhyessumni-ta.
bear-TOP him-ACC pointed at-DEC
'The rabbit saw the bear in the forest. The bear pointed at him.'

b. i salam-un Yenglani-i-ko i salam-un Sena-
this person-TOP Yenglan-be-COMP this person-TOP Sena-
ipni-ta. Yenglani-nun kunye-lul kalikhi-koiss-nayo?
be-DEC Yenglan-TOP her-ACC point at-ING-Q
'This is Yenglan and this is Sena. Is Yenglan pointing at her?'

c. thokki-nun kom-i ku-lul kalikhi-koiss-ta-ko
rabbit-TOP bear-NOM him-ACC point at-ING-DEC-COMP
sayngkakhapni-ka?
think-Q
'Does the rabbit think that the bear is pointing at him?'

d. i salam-un Incheli-i-ko i salam-un
this person-TOP Inchel-be-COMP this person-TOP
Yenglani-ipni-ta. Incheli-nun Yenglani-ka ku-lul
Yenglan-be-DEC. Inchel-TOP Yenglan-NOM him-ACC
kalikhi-koiss-ta-ko sayngkakhapni-kka?
point at-ING-DEC-COMP think-Q
'This is Inchel and this is Yenglan. Does Inchel think that Yenglan is pointing at him?'

e. kom-i wul-koissul-ttay thokki-nun ku-lul
bear-NOM cry-ING-when rabbit-TOP him-ACC
kalikhyessumni-ta.
pointed at-DEC
'While the bear was crying, the rabbit pointed at him.'

f. thokki-ka ku-lul mancyessul-ttay kom-un cam-ul
rabbit-NOM him-ACC touched-when bear-TOP
ca-koissessumni-ta.
sleep-ING-DEC
'When the rabbit touched him, the bear was sleeping.'

The test sentences included two simple sentences and four complex sentences. Simple sentences (3a) and (3b) included pronouns *ku* and *kunye*, respectively. Among four complex sentences, (3c) and (3d) were sentences containing an embedded clause. While (3c) showed the same gender condition, (3d) was a gender control sentence. That is, in (3d) the pronoun *ku* has the same gender as its correct nonlocal c-commanding antecedent (Inchel) and has a different gender from its incorrect local c-commanding antecedent (Yenglan). The other two complex sentences (3e) and (3f) were temporal participial sentences.

According to Principle B of the binding theory, a pronoun may not have a local-c-commanding antecedent. Thus, a child must reject the intraclausal interpretations of *ku*/*kunye* in

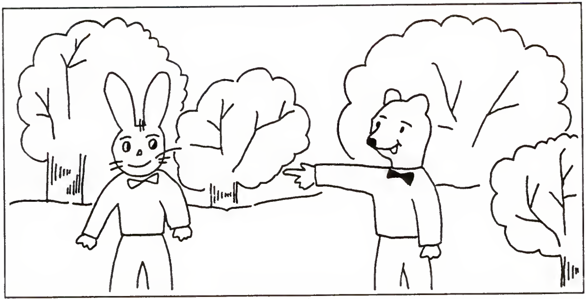


Figure 23 (3a) The Match Condition

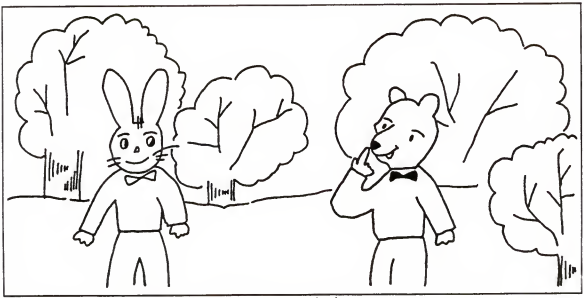


Figure 24 (3a) The Mismatch Condition

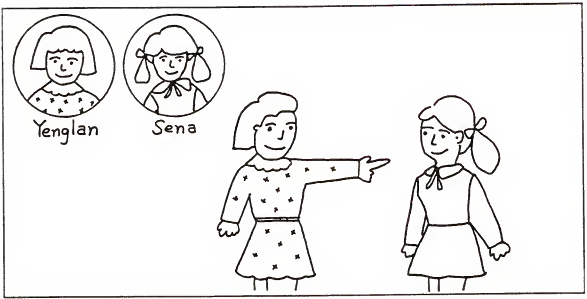


Figure 25 (3b) The Match Condition

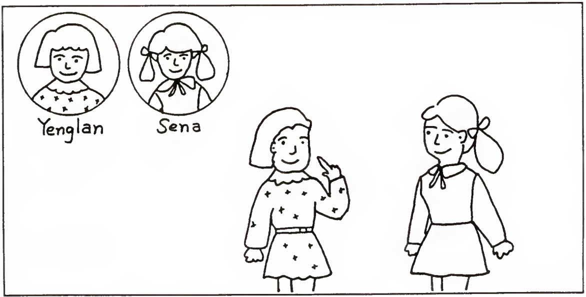


Figure 26 (3b) The Mismatch Condition

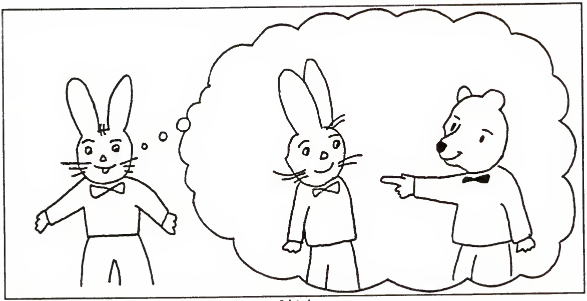


Figure 27 (3c) The Match Condition

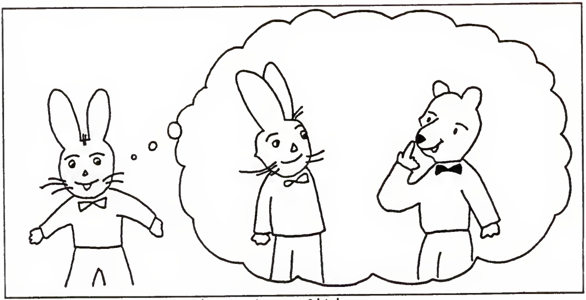


Figure 28 (3c) The Mismatch Condition

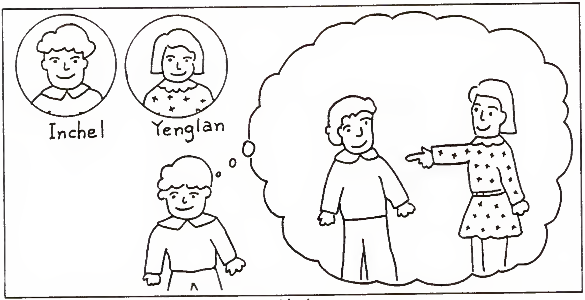


Figure 29 (3d) The Match Condition

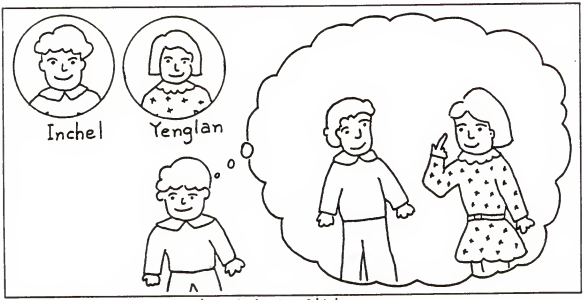


Figure 30 (3d) The Mismatch Condition

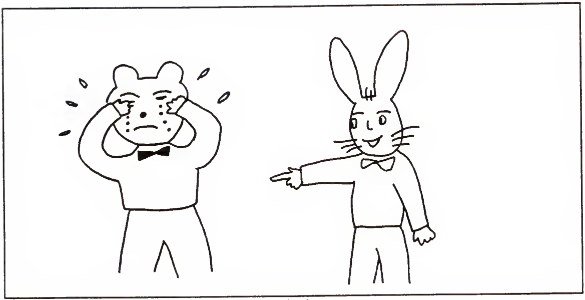


Figure 31 (3e) The Match Condition

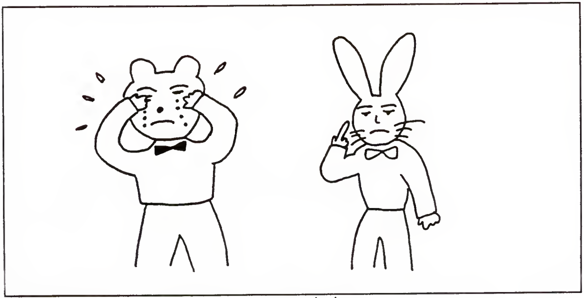


Figure 32 (3e) The Mismatch Condition

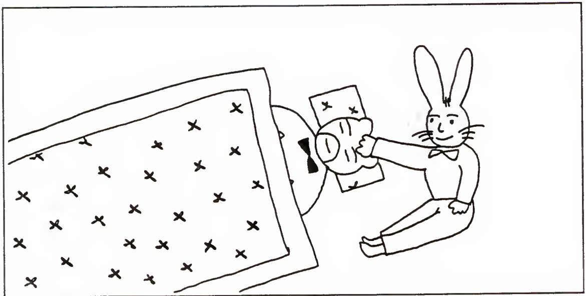


Figure 33 (3f) The Match Condition

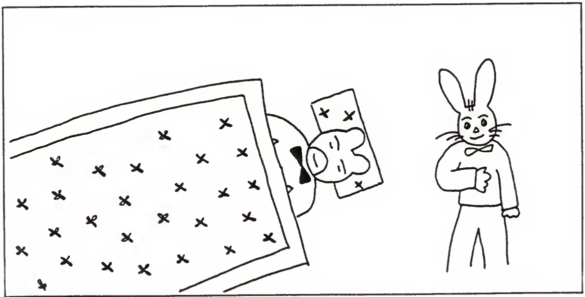


Figure 34 (3f) The Mismatch Condition

sentences (3a-3f) to demonstrate his or her knowledge of Principle B.

Results. Figure 35 shows the children's correct responses to the simple sentences (3a) and (3b). Since no significant difference in performance between two sentences (the sentence containing the pronoun ku 'he' and the sentence containing the pronoun kunye 'she') was found (F(1,101)=1.48, p=.224)[5], the results from (3a) and (3b) were taken together. As indicated in Figure 35, in the match condition, the children's correct responses increased from about 69% correct for the youngest to almost perfect (95.45%) for the oldest. However, in the case of the mismatch condition, the children's performance remained at only about 70% correct in the oldest age group. In both the match and the mismatch conditions, a steady improvement in performance was found.

Figure 36 indicates the children's correct responses to complex sentences with one embedded clause. Since there was no significant difference in performance between the same gender sentence (3c) and the gender control sentence (3d)

---

[5] While (3b) includes a simple introductory sentence, (3a) includes the context sentence which provides a more natural discourse antecedent for the pronoun. In spite of this difference, the children's performance on these two sentences did not show any difference. This fact suggests that children may not be so sensitive to discourse context. The finding that children are not strongly led by pragmatic and discourse context in performance on the syntactic requirements of the Binding Theory was provided by Stevenson and Pickering (1987). This contradicts Grimshaw and Rosen (1990) who argue that the provision of linguistic discourse antecedents for pronouns is extremely important.

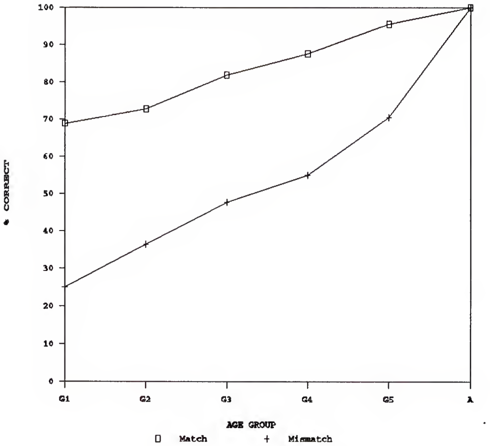


Figure 35 Percentage of Correct Responses to (3a) and (3b)

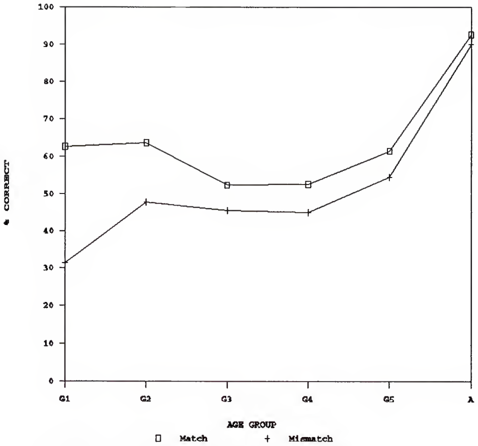


Figure 36 Percentage of Correct Responses to (3c) and (3d)

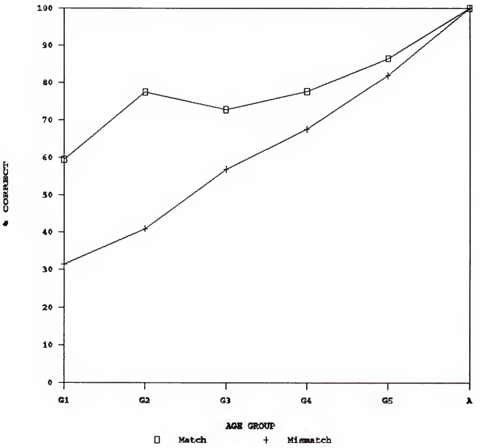


Figure 37 Percentage of Correct Responses to (3e) and (3f)

(F(1,101)=.04, p=.842)[6], the results from these two sentences were collapsed. Figure 36 shows that the children's correct responses, in both the match and the mismatch conditions, did not change much over development. Their correct performance stayed around the chance level. The adult controls also did not perform very well on these sentences. Korean adults responded correctly to these sentences about 90% of the time, while they performed perfectly (100%) on sentences (3a), (3b), (3e) and (3f).

Figure 37 illustrates the children's correct responses to the temporal participial sentences (3e) and (3f). As indicated in the figure, the children's performance changed as their ages increased. In the match condition, the children's correct responses grew from a level of 59% correct for the youngest to a level of 86% correct for the oldest. In the mismatch condition, their performance increased from a level of 31% correct to a level of 82% correct.

In order to see if there are significant differences in performance across conditions and sentence types, the two factor repeated ANOVA was performed. Results of the ANOVA indicated a significant effect of conditions (F(1,101)=40.40, p<.001), and of sentence types (F(2,202)=21.22, p<.001).

---

[6] The fact that the gender matching cue did not help children's coreference judgments indicates that the subjects did not understand that the pronoun ku is used for male reference. This result is in contrast with the results from English studies in which children paid attention to the gender matching cue and made the right judgments perfectly (Wexler and Chien, 1985).

Interaction between conditions and sentence types was also obtained (F(2,202)=11.75, $p<.001$). Further analysis (Tukey's procedure) revealed that the simple sentences and the temporal participial sentences were significantly better performed than the complex sentences with an embedded clause with respect to the match condition ($p<.05$).

The children's poor performance on the complex sentences with an embedded clause needs to be explained. One possible explanation would be that sentences like (3c) and (3d) were quite complex syntactically, so the children might have had parsing problems with these sentences. Another explanation is that sentences like (3c) and (3d) are more or less unnatural in Korean in terms of their intended meaning, although they are not ungrammatical. As shown in the previous chapters, Korean reflexive caki can refer to long-distance antecedents as well as local antecedents in complex sentences with an embedded clause. Thus, when the matrix subject is intended as a referent, caki rather than ku might be used in sentences like (3c) and (3d). Sentences (3c) and (3d) would sound more natural if ku refers to a person other than the matrix subject, i.e., a person mentioned in the discourse. The poor performance on sentences (3c) and (3d), then, can be attributed to the unnaturalness of the test sentences.[7] The fact that adult controls also accepted the mismatched sentence-meaning pairs 15% of the time in (3c) and (3d) supports this argument.

---

[7] Here, "unnaturalness" means slight deviation from what is natural in terms of common usage.

The analysis of individual children's responses showed that as children's age increased, more children gave perfect responses to sentences (3a-f): 0(G1), 1(G2), 2(G3), 3(G4) and 6(G5).

In this experiment the children's responses to the filler sentences were correct 85% of the time.

Experiment for Principle C

This experiment was designed to test children's knowledge of Principle C, which concerns the interpretation of R-expressions.

Materials. The following target sentences and the pictures were used in this experiment:

(4) a. thokki-nun swuphsok-eyse kom-ul mannassumni-ta.
rabbit-TOP forest-in bear-ACC saw-DEC
ku-nun kom-ul kalikhyessumni-ta.
he-TOP bear-ACC pointed at-DEC
'The rabbit saw the bear in the forest. He pointed at the bear.'

b. i salam-un Incheli-i-ko i salam-un Dongswu-
this person-TOP Inchel-be-COMP this person-TOP Dongswu-
ipni-ta. ku-nun Dongswu-ka sakwa-lul mek-koiss-ta-ko

be-DEC he-TOP Dongswu-NOM apple-ACC eating-be-DEC-COMP

malhayssumni-ta.

said-DEC

'This is Inchel and this is Dongswu. He said that Dongswu was eating an apple.'

c. i salam-un Incheli-i-ko i salam-un Dongswu-

this person-TOP Inchel-be-COMP this person-TOP Dongswu-

ipni-ta. ku-nun Incheli-ka chayk-ul ilknun-dongan

be-DEC he-TOP Inchel-NOM book-ACC read-while

sakwa-lul mekessumni-ta.

apple-ACC ate-DEC

'This is Inchel and this is Dongswu. He ate an apple while Inchel was reading a book.'

d. i salam-un Incheli-i-ko i salam-un Dongswu-

this person-TOP Inchel-be-COMP this person-TOP Dongswu-

ipni-ta. ku-ka kongpwu-lul hal-ttay Incheli-nun umak-ul

be-DEC he-NOM study-ACC do-when Inchel-TOP music-ACC

tutupni-ta.

listen to-DEC

'This is Inchel and this is Dongswu. While he studies, Inchel listens to the music.'

e. i salam-un Incheli-i-ko i salam-un Dongswu-

this person-TOP Inchel-be-COMP this person-TOP Dongswu-

ipni-ta. ø TV-lul pol-ttay Incheli-nun sakwa-lul

be-DEC TV-ACC watch-when Inchel-TOP apple-ACC

mekessumni-ta.

ate-DEC

'This is Inchel and this is Dongswu. While he was watching TV, Inchel ate an apple.

Principle C of the Binding Theory, which states that R-expressions must be free, entails that a pronoun may not c-command its referent. In order to test children's knowledge of this constraint, three types of sentences (4a-c) were used. In the simple sentence (4a), the R-expression bear may not be interpreted as coreferential with the preceding pronoun ku. In the complex sentences (4b) and (4c), the pronoun cannot be coreferential with the R-expressions Dongswu and Inchel, respectively, since the pronoun c-commands them.

Some previous studies (Tavakolian, 1978; Solan, 1983) proposed that young children avoided backwards coreference solely on the basis of linear order. However, more recently Crain and McKee (1985) argued against this proposal and demonstrated the availability of backwards anaphora[8] interpretation in the grammars of young children. They found evidence of children's syntactic knowledge of the structural constraint on backwards anaphora by using a truth-value judgment task. Sentences (4d) and (4e) aimed to examine if children's grammars also were structure-dependent. Since in (4d) and (4e) the R-expressions are not c-commanded by the

---

[8] Backwards anaphora refers to coreference between a pronoun and a following R-expression.

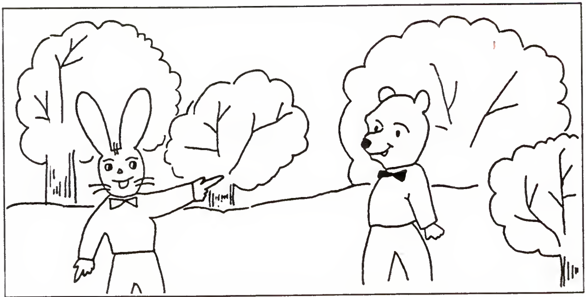


Figure 38 (4a) The Match Condition

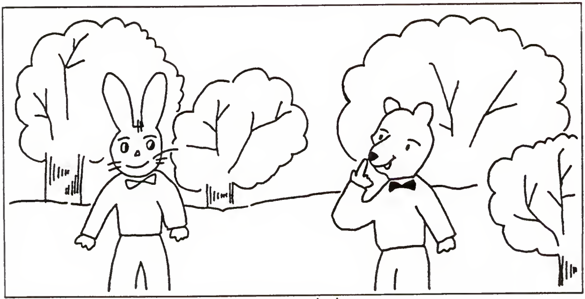


Figure 39 (4a) The Mismatch Condition

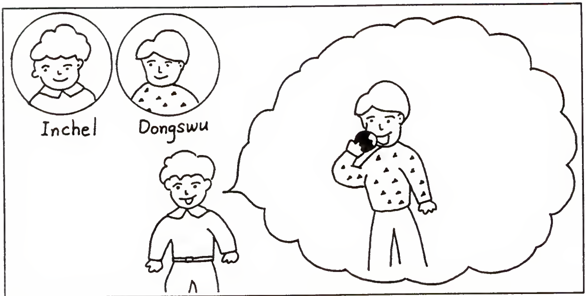


Figure 40 (4b) The Match Condition

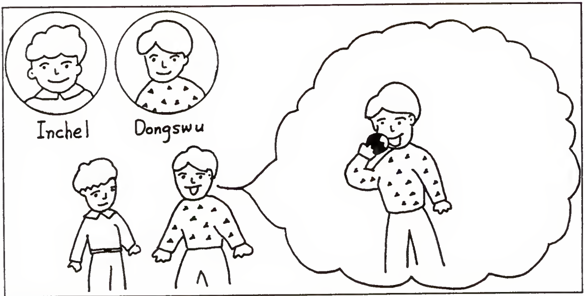


Figure 41 (4b) The Mismatch Condition

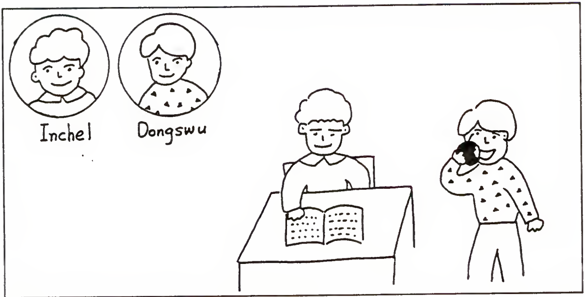


Figure 42 (4c) The Match Condition

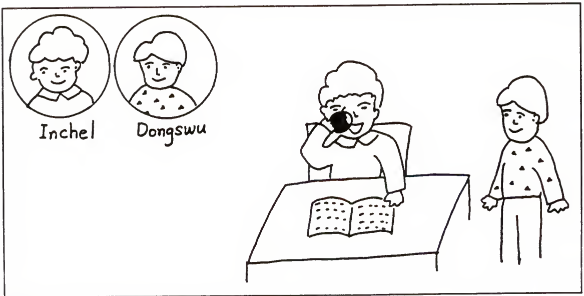


Figure 43 (4c) The Mismatch Condition

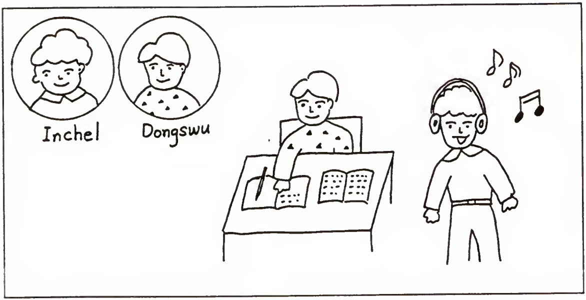


Figure 44 (4d) External Reference

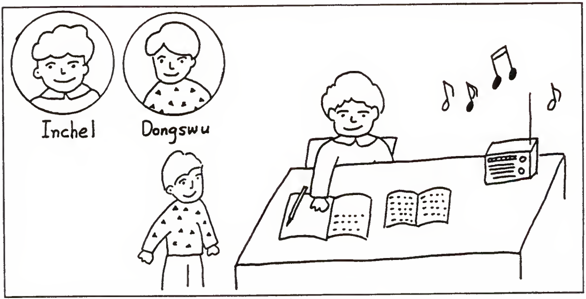


Figure 45 (4d) Backwards Coreference

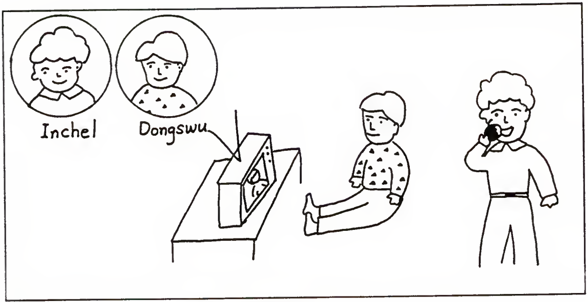


Figure 46 (4e) External Reference

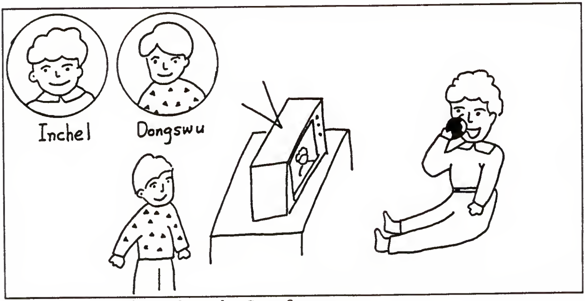


Figure 47 (4e) Backwards Coreference

preceding pronouns (in (4d) by the overt pronoun ku, and in (4e) by the null pronoun ø), coreference between the R-expressions and the pronouns is not prohibited. Thus, backward anaphora interpretations as well as extrasentential interpretations are allowed in these sentences.

Results. Figures 48-52 illustrate the results of the experiment. Figure 48 shows the children's performance on the simple sentence (4a). In the match condition, their correct responses increased from a level of 63% correct to perfect performance. However, in the mismatch condition, the children did not perform well. The first two age groups of children correctly rejected the intrasentential interpretation of the R-expression only about 20% of the tme. The final three groups of children correctly rejected the mismatched sentence-meaning pair from 60% to 77% of the time.

Figure 49 indicates the children's correct responses to sentence (4b), the complex sentence with an embedded clause. In the match condition, even the youngest children responded correctly more than 80% of the time. In the mismatch condition, again the children showed poor performance. The first three groups of children correctly responded "no" only about 20% of the time, and the final two groups gave the correct responses 40% and 72% of the time, respectively. 6- and 7-year-olds (Groups 3 and 4) showed particularly low performance on (4b) relative to performance on (4a) and (4c) with respect to the mismatch condition.

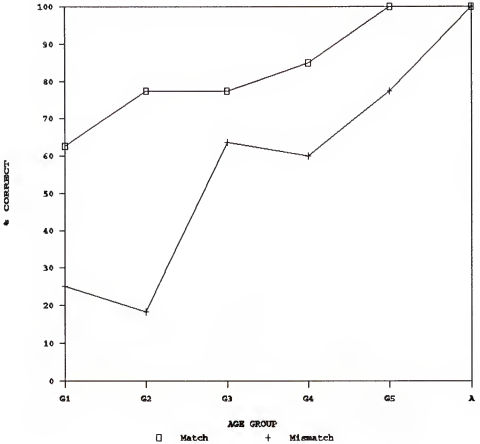


Figure 48 Percentage of Correct Responses to (4a)

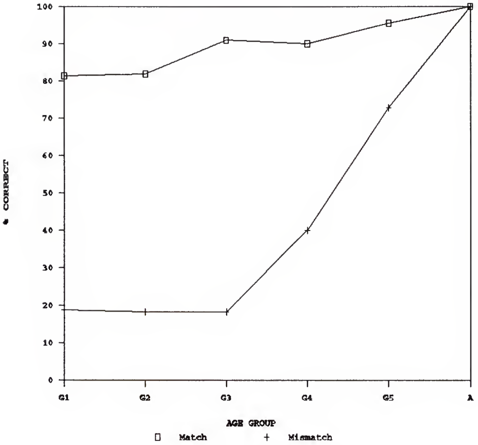


Figure 49 Percentage of Correct Responses to (4b)

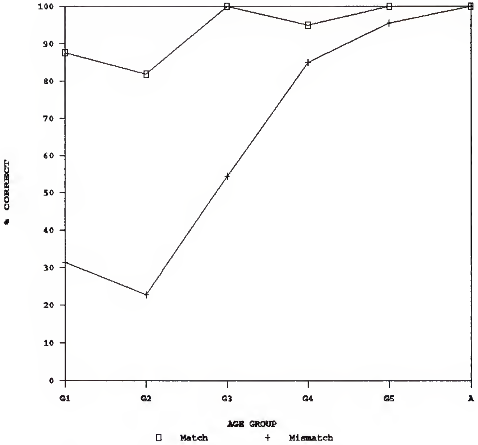


Figure 50 Percentage of Correct Responses to (4c)

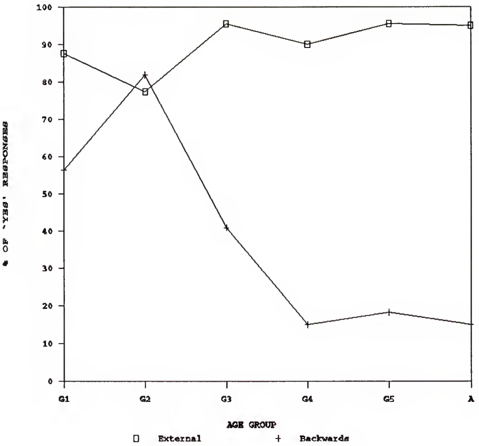


Figure 51 Percentage of 'Yes' Responses to (4d)

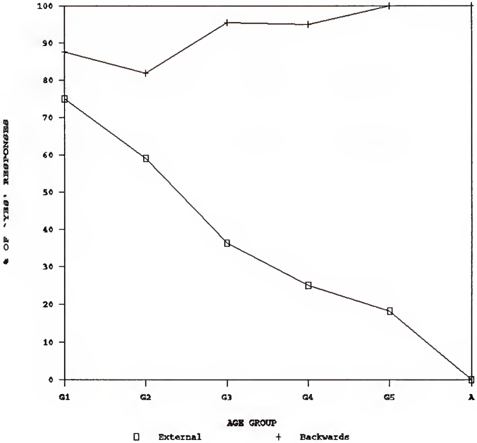


Figure 52 Percentage of 'Yes' Responses to (4e)

As on sentences (4a) and (4b), the children, in the match condition, performed very well on sentence (4c), a temporal participial sentence. As indicated in Figure 50, the children in all age groups gave the correct responses between 82% and 100% of the time in the match condition. In the mismatch condition, the first two groups of children responded correctly only about 27% of the time. However, in the final three age groups the children's correct responses increased from the level of 55% correct to the level of 96% correct.

In order to determine whether there are significant differences in performance across conditions and sentence types, a two factor repeated ANOVA was run. Results of the ANOVA indicated a significant condition effect ($F(1,101)=105.21$, $p<.001$), a significant effect of sentence types ($F(2,202)=21.32$, $p<.001$), and a significant interaction between conditions and sentence types ($F(2,202)=13.12$, $p<.001$). Tukey's procedure revealed that the temporal participial sentence (4c) was significantly better performed than the complex sentence with an embedded clause (4b) with respect to the mismatch condition ($p<.05$).

The analysis of individual children's responses indicated that as children's age increased, more children gave 100% correct responses to sentences (4a-c): 0(G1), 0(G2), 3(G3), 5(G4) and 13(G5).

Figures 51-52 illustrate the results from sentences (4d) and (4e), respectively. While both extrasentential and backwards anaphora interpretations are allowed in these sentences, the children rejected backwards anaphora interpretation for (4d) and the extrasentential interpretation for (4e) most of the time. In the case of sentence (4d), the children's rejection of backwards anaphora interpretation increased from the level of 38% to the level of 82% for the oldest. The adult controls also rejected backwards anaphora interpretation of this sentence 85% of the time. By contrast, in the case of sentence (4e), which has a null pronoun, the children in all age groups accepted backwards anaphora interpretation more than 90% of the time. Their rejection of the extrasentential interpretation of this sentence increased from the level of 25% for the youngest to the level of 82% for the oldest. Korean adult controls accepted only backwards anaphora interpretation of this sentence. These results indicate that a language-particular principle may strongly have affected the subjects' responses. While Principle C of the binding theory allows both extrasentential and backwards anaphora interpretations of these two sentences, a discourse or pragmatic principle in Korean[9] might impose very strong

---

[9] When there exists an extrasentential referent in the context, the pronoun ku in sentences like (4d) usually refers to the extrasentential referent.

The null pronoun may be coreferential with the extrasentential antecedent only if it is preceded by an appropriate previous discourse. Examples include the following:

emeni$_i$-nun yoli-lul hasyess-ta. ø$_i$ yoli-lul hasinun dongan
mother-TOP cooked-DEC cooking while

preferences for one interpretation over another. The results from these two sentences are not consistent with the claim that the prohibition against backwards coreference is a part of the child's early grammar.

In this experiment, the children responded correctly to the filler sentences 90.11% of the time, which means that they were paying attention to the task.

Discussion

The percentages of the children's correct responses to sentences containing reflexives (caki)[10], pronouns and R-expressions are illustrated in figures 53 and 54. Figure 53 concerns the match condition and figure 54 concerns the mismatch condition. The line with squares shows the results for the reflexives; the line with crosses shows the results for the pronouns; the line with diamonds shows the results for the R-expressions. Figure 53 indicates that the children performed better on reflexives and R-expressions than on pronouns in the match condition. In the mismatch condition, children's performance on the reflexive caki was strikingly

---

halmeni-nun sinmum-ul posess-ta.
grandmother-TOP newspaper read-DEC
'The mother cooked. While she was cooking, the grandmother read the newspaper.'

[10] The result from sentence (1f), which is relevant to the investigation of the Proper Antecedent Parameter, was not included in this analysis.

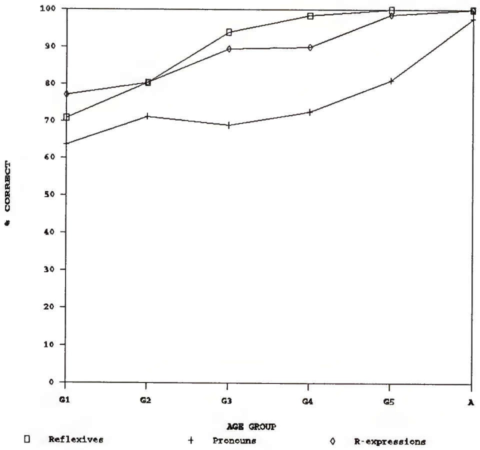


Figure 53 Percentages of Correct Responses to Reflexives (caki), Pronouns and R-expressions: the Match Condition

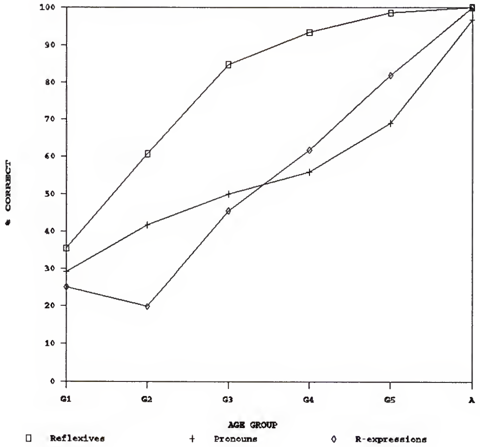


Figure 54 Percentages of Correct Responses to Reflexives (caki), Pronouns and R-expressions: the Mismatch Condition

higher than performance on pronouns and R-expressions. This is illustrated in figure 54. On the basis of figure 54, one may argue that Principle A is respected early relative to Principles B and C. However, if we consider the results from the reflexive cakicasin and the reciprocal selo as well as the reflexive caki, a rather different picture emerges. Figures 55 and 56 indicate the percentages of the children's correct responses to all sentences relevant to Principles A, B and C. Principle A sentences include caki, cakicasin or selo. In the case of Principle B, the results from the complex sentences with one embedded clause are not included in the analysis for the reasons described above. Figures 55 and 56 clearly suggest that Principle B is not necessarily less available to children early in their grammatical development than Principle A. No striking difference in performance between the three Principles is indicated in the figures.

The fact that there was a steady increase in performance from younger to older children on all three Principles (with the exception of complex sentences with one embedded clause which are relevant to Principle B) strongly supports the Lexical Learning Hypothesis (Wexler and Chien, 1985; Wexler and Manzini, 1987): the binding principles are part of the innate endowment that the child brings to the language acquisition task, and only lexical items have to be learned. That is, the child has to learn whether a particular lexical item is a reflexive or a pronoun. This hypothesis maintains

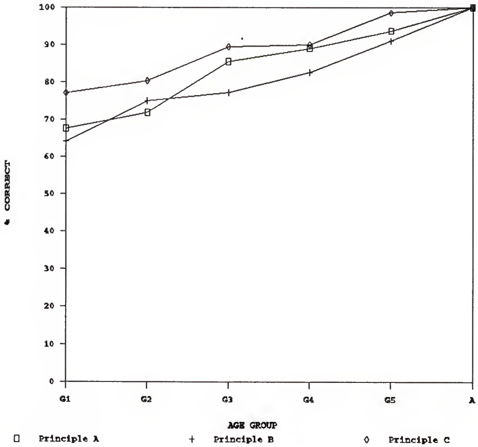


Figure 55 Percentages of Correct Responses to Principles A, B and C: the Match Condition

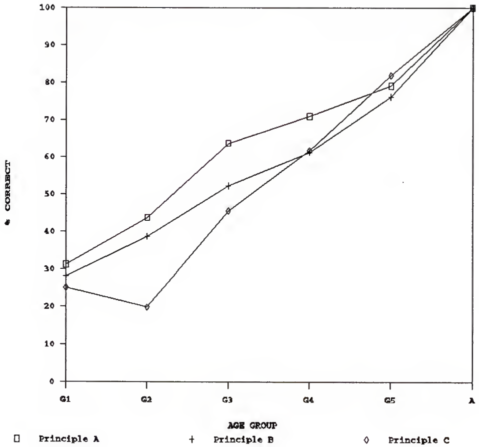


Figure 56 Percentages of Correct Responses to Principles A, B and C: the Mismatch Condition

that knowledge of the binding principles clearly depends on the acquisition of the lexical items. Although the binding principles are operative at the onset of development, knowledge of those principles would not be evident until the child learns the lexical items to which that knowledge applies. This implies that as long as the child learns the lexical properties of a reflexive or a pronoun, he or she should be able to relate these lexical items to the corresponding principles and to correctly identify their antecedents. Since it takes children a certain period of time to learn certain lexical items, the increase in children's performance reflects the fact that lexical learning must take place.

McKee (1988) argues that in order to support the Lexical Learning Hypothesis, we should know what percentage of children responded 100% correctly at each stage. This implies that if a child comes to know the lexical properties of a reflexive or a pronoun, he or she will give 100% correct responses to sentences containing the reflexive or the pronoun. This is because the binding principles become automatically operative once the child learns the relevant lexical items. In the result sections, I reported the number of the children who gave 100% correct responses to sentences containing caki, ku or a R-expression at each stage. The numbers indicate that as children's age increased, more children gave 100% correct responses to these sentences.[11] This fact suggests that more and more children completed the learning of the relevant lexical items.

The results from the three experiments concerning Korean children's acquisition of the binding principles suggest that children's violation of the binding principles might be due to incomplete learning of the relevant lexical items. Korean children performed very well with the reflexive caki. However, with respect to another type of reflexive cakicasin and the reciprocal selo, they showed poor performance, although both reflexives and reciprocals are subject to Principle A. The children also showed problems with Principles B and C in which the pronoun ku is involved. Based on these observations, we can conclude that Korean children acquire the reflexive caki earlier than the reflexive cakicasin, the reciprocal selo and the pronoun ku. The reason why this should be the case is not clear, but caki seems to be used more frequently than cakicasin, selo or ku in natural conversation. Evidence that Korean children do not understand lexical items such as cakicasin, selo and ku early can be found in the children's responses. For example, when the experiment concerning Principle B was done, many of the children showed vacillation in responding, and some of them said "I don't understand what ku means". As argued in Atkinson (1992), there is little point in investigating whether or not the child's grammar contains Principle B of the Binding Theory before he or she has pronouns. Therefore, the claim that a principle is operative from the onset of development must be understood as a claim that the principle is opeartive as soon as the child acquires the lexical item to which that principle applies.

---

[11] If we assume that a number of performance factors may influence children's performance on Principles B and C, as Grimshaw and Rosen (1990) argue, the children's knowledge at each stage may be higher in the cases of Principles B and C.

McKee (1992) argues that there is a general problem in the Lexical Learning Hypothesis. The problem is to explain why children should take so long to learn certain lexical items. However, few would deny that lexical learning is a hard task that requires a lot of time. That a child acquired a word like ku means that he or she understood all the properties associated with that word, for example, [+third person, +singular, +male ...]. Although children acquire the major components of their language - sounds, structures and basic words - in a short time, lexical learning extends over a long period of time, and acquisition of the literary language does not occur until children enter school. Obviously, a certain lexical item cannot be learned without sufficient input. Given this, and considering the fact that third person pronouns such as ku and kunye are rarely used in everyday conversation in Korean[12], we may predict that it will take Korean children a long time to understand the properties associated with pronouns.

---

[12] Kang (1990)'s study on Korean anaphora suggests that the pronoun ku and kunye seem to be restricted to written discourse. In informal conversation, third person pronouns usually do not occur. Instead, repeated NPs are used.

Hyams and Sigurjónsdóttir (1990) argue that it seems unlikely that the difficulty with pronouns is directly related to frequency in the input. This claim is based on Danish and English data. Danish and English children also showed poor performance on pronominal binding with pronouns although pronouns frequently occur in the input in these languages. Wexler and Chien (1985) report that English-speaking children violate Priniciple B some significant percentage of the time in spite of their free use of the pronoun. McDaniel, Cairns and Hsu (1990) also note that "something more complex than lexical learning is going on with respect to Principle B" (p. 130).[13] All these observations pose one important question: why is Principle B not always obeyed if children do know Principle B? Grimshaw and Rosen (1990) provide some reasons (See Chapter 3, pp. 84-85) why children's performance on pronouns might be depressed. Goodluck (1990) also provides a reason from the sentence processing perspective. Goodluck (1990, p.370) presents an outline of processing stages as in figure 57. The assumption is that the normal processing of a sentence by adults involves initial stages of lexical and syntactic analysis at the sentence level, followed by

---

[13] McDaniel, Cairns and Hsu found many children who had obeyed Principles A and C but violated Principle B. They argue that there are too many children who obey C and A to suggest that they have not categorized pronouns in their lexican.

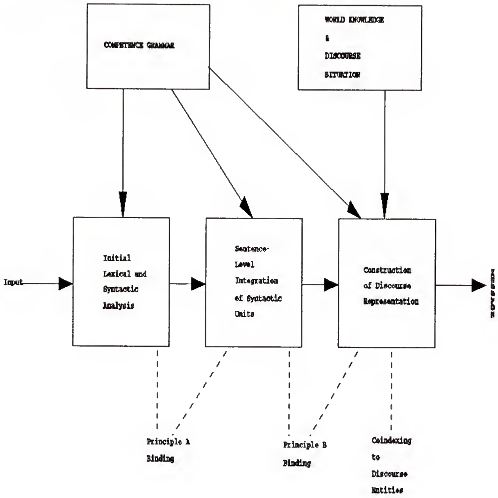

COMPETENCE GRAMMAR
WORLD KNOWLEDGE & DISCOURSE SITUATION
Input
Initial Lexical and Syntactic Analysis
Sentence-Level Integration of Syntactic Units
Construction of Discourse Representation
RESPONSE
Principle A Binding
Principle B Binding
Coindexing to Discourse Entities

Figure 57 An Outline of Processing Stages (Source: Goodluck, 1990)

integration of discourse information into this analysis. Goodluck, based on work by Stevenson and Pickering (1987), argues that children are relatively poor at integrating discourse information into their comprehension because efficient use of pragmatic and discourse information may develop only as processing capacity increases. Within this model, a performance difference between reflexives and pronouns is predicted. While reflexive binding is syntactically restricted to a position of proximity to the reflexive, pronominal binding may or may not occur inside the sentence and when it occurs inside the sentence it does at a greater structural distance than reflexives. Thus, while reflexive binding is achieved in the early, purely syntactic stages of processing, pronominal binding takes place at relatively late stages in parsing. Assuming that children's processing capacity is limited and that pronominal binding requires broader syntactic spans and use of discourse and pragmatic information for indexing, we may expect the developmental delay of Principle B relative to Principle A. Deutsch, Koster and Koster (1987) also notice this point. They argue that one of the reasons why reflexive binding is easier for children than pronominal binding is that reflexive binding is restricted to single sentences, while pronominal binding allows both sentence-internal and -external reference.

Although I have argued that Korean children's poor performance on Principles B and C might be attributed to incomplete learning of the relevant lexical items, it cannot be denied that other factors such as processing limitation might also affect the children's performance. Therefore, in interpreting the experimental results, more than one explanation must be considered. Since performance does not directly reflect competence, we cannot say, on the basis of children's poor performance, that they do not know the binding principles.

Whatever reasons are behind children's poor performance on pronominals, one thing is certain: assuming the unavailability of negative evidence in L1 acquisition, knowledge of binding goes beyond the input. That is, binding constraints cannot have been learned. Therefore, any evidence of children's knowledge of binding constitutes strong support for UG. Although young children do not always obey the binding principles for various reasons, this does not mean that they do not know the binding theory. The binding theory seems to be a part of a speaker's innate endowment and UG seems to constrain child language from the onset of development. This argument is compatible with the Continuity Hypothesis proposed by Pinker (1984) and Hyams (1986).[14]

---

[14] As discussed in Chapter 1, the Continuity hypothesis claims that all of the innately specified principles for language acquisition are present at all stages of first language development. Under this view, changes occurring in the child's grammar over time are attributed to increases in the child's lexicon and increases in the child's processing capacities (Clahsen, 1992).

The Acquisition of the Long-Distance Reflexive 'caki'

As noted earlier, Korean, unlike English, allows long-distance anaphora with the reflexive caki. This experiment was designed to examine the acquisition of the long-distance reflexive 'caki' in Korean.

The Experimental Hypotheses

With respect to the experiment, the research hypotheses were formulated as follows.

The Subset principle.

H1: The Subset Principle operates in L1 acquisition, so Korean-speaking children would pass through a developmental stage in which they prefer the local antecedent.

H2: The developmental interpretation of the Subset Principle does not hold, so there would be no stage in which Korean children prefer the local antecedent for the refelxive 'caki'. Rather, they would exhibit adultlike responses from the beginning, i.e., the preference for the long-distance antecedent.

Referential versus bound variable readings.

H1: As argued in Chien and Wexler (1990), children do know Binding Principle B, yet they do not have the pragmatic principle P. This predicts no performance difference between bound variable and referential reflexives since anaphors are subject to the binding theory regardless of whether or not they are bound variables.

H2: As claimed in Grimshaw and Rosen (1990), bound variable interpretations may not always be available to children. This predicts that performance on bound variable anaphors is lower than performance on referential anaphors since children tend to reject sentence-meaning pairs when they fail to construct bound variable interpretations.

Method

Subjects. 100 Korean-speaking children ranging in age from 4;1 to 9;0 and 20 adult controls participated in the experiment. The child subjects were selected from kindergartens and elementary schools in Ili, Korea. A control group of 20 adults consisted of students attending a college in Ili, Korea.

Procedure. This experiment followed the same procedures used in the experiments for the binding principles.[15] However, in addition to the pretest already mentioned, a second pretest was given to the child. The second pretest served several purposes. First, it aimed to ascertain that a child knew that a reflexive must have an antecedent in the sentence. If a child does not have this knowledge, he or she may reject both local and long-distance antecedents for the reflexive caki. Second, it served as a check on whether a child understood the Korean quantifier motun 'all'.[16] If a child does not understand the quantifier motun, he or she may not construct bound variable interpretations. For this purpose, a picture which describes some rabbits crying and others smiling was presented to the child. To demonstrate his or her understanding of motun, the child must reject the picture. Third, in order to make sure that a child does not reject pictures describing local or long-distance binding for the misanalysis of subject, a picture in which the matrix subject is wrongly involved in the action of the embedded verb as an actor was presented to the child. By correctly rejecting the picture, the child can show that he or she knows that the actor must be the embedded subject. The second pretest is listed in Appendix B. Only the children who correctly responded all the items on both first and second pretests were included in the experimental groups. Of the children pretested, 26 failed. Most of the children who failed were younger than 6.

---

[15] In contrast to the first three experiments, "Do not know" responses were not allowed in this experiment.

---

[16] While pronouns as wells as reflexives are interpreted as bound variables in English, only reflexives are interpreted as bound variables in Korean. Consider the following example.

*motun ai$_i$-ka ku$_i$-lul kalikhyess-ta.
all child-NOM him-ACC pointed at-DEC
'Every child pointed at him.'

As in the first three experiments, filler sentences, which serve as a check on whether children are paying attention, were included in this experiment.

Materials. The following sentences and pictures were used to examine the Subset Principle effect in Korean children's acquisition of the long-distance reflexive caki.

(5) a. thokki-nun kom-i caki-lul kalikhi-koiss-ta-ko
rabbit-TOP bear-NOM self-ACC point at-ING-DEC-COMP
sayngkakhapni-kka?
think-Q
'Does the rabbit think that the bear is pointing at self?'

b. thokki-nun motun kom-i caki-lul kalikhi-koiss-ta-
rabbit-TOP all bear-NOM self-ACC point at-ING-DEC-
ko sayngkakhapni-kka?
COMP think-Q
'Does the rabbit think that all the bears are pointing at self?'

Two types of sentences were included in this experiment. Both types of test sentences were complex sentences with one embedded clause. However, sentence (5a) was different from sentence (5b) with respect to what types of NPs occurred in their subject positions. Sentence (5a) included two referential names as possible antecedents for the reflexive

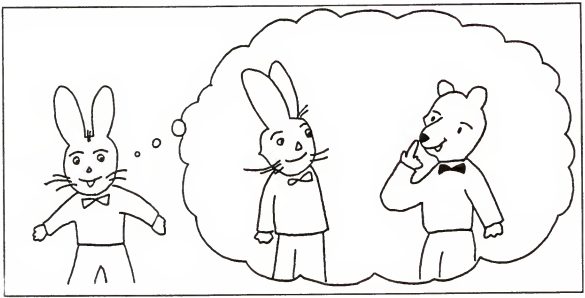


Figure 58 (5a) Local Binding

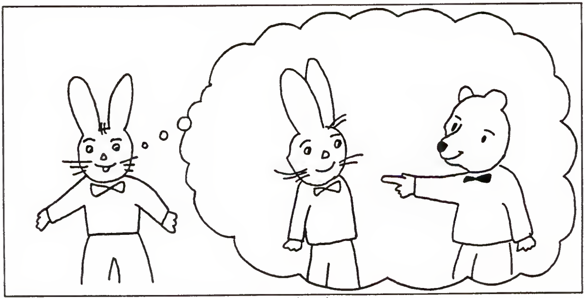


Figure 59 (5a) Long-Distance Binding

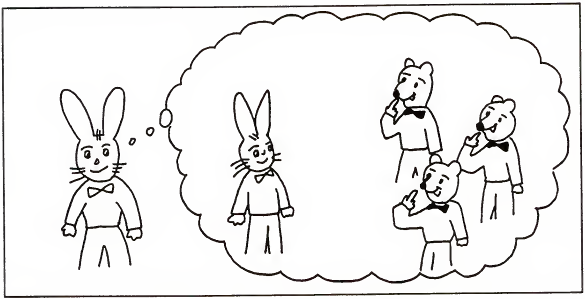


Figure 60 (5b) Local Binding

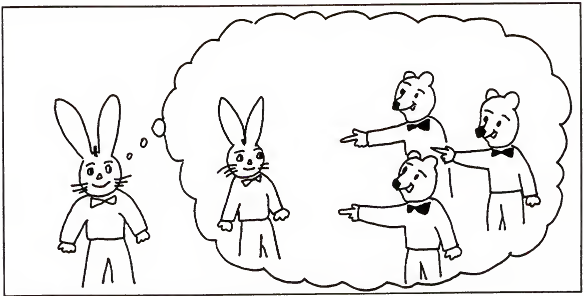


Figure 61 (5b) Long-Distance Binding

caki, whereas sentences (5b) included a referential name and a quantified NP as possible antecedents. In (5a) the reflexive caki can be bound either to the matrix subject, i.e., the long-distance antecedent, or to the embedded subject, i.e., the local-antecedent. In (5b) caki can be bound to the long-distance subject, or interpreted as a variable bound by the local quantified NP.

Results

The results of the experiment are illustrated in figures 62 and 63. Figure 62 shows the results of the "name-name-reflexive" condition and figure 63 shows the results of the "name-quantifier-reflexive" condition. In each figure, the line with squares represents local binding and the line with crosses represents long-distance binding. The results show that Korean children younger than 5 strongly prefer the local antecedent over the long-distance antecedent for the reflexive caki. In the children at age 4 (G1), the locality effect was significant in the "name-name-reflexive" condition ($t(19)=2.67$, $p<.05$). As children's age increased, the long-distance antecedent was more preferred. In the children at age 6, the long-distance antecedent was significantly better performed than the local antecedent in both "name-name-reflexive" ($t(19)=2.65$, $p<.05$) and "name-quantifier-reflexive" ($t(19)=2.27$, $p<.05$) conditions. The adult controls also showed

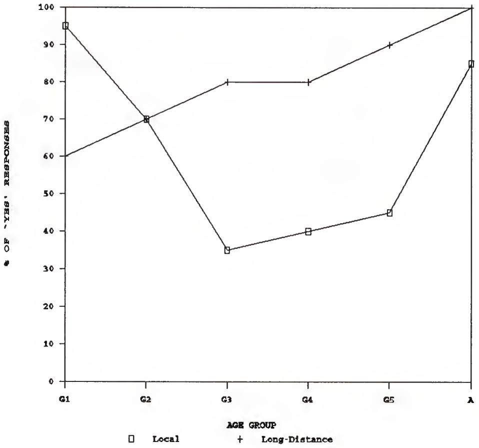


Figure 62 Percentage of 'Yes' Responses to (5a)

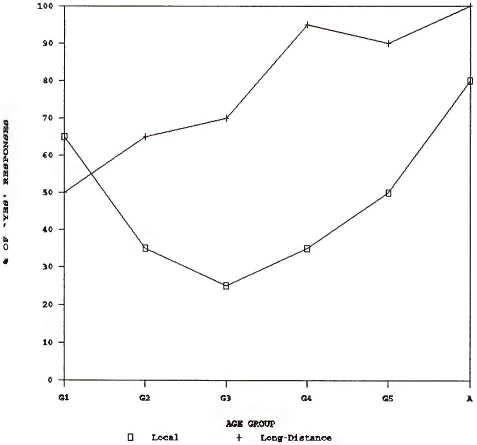


Figure 63 Percentage of 'Yes' Responses to (5b)

the preference for the long-distance antecedent.

Concerning the issue of referential versus bound variable readings, the experimental results are consistent with Grimshaw and Rosen (1990). The children at age 4 performed significantly better on the referential antecedent than on the bound variable antecedent in terms of local binding ($F(1,19)=6.22$, $p<.05$).

The analysis of individual children's responses revealed the following. In the "name-name-reflexive" condition, 8 out of 20 4-year-olds allowed only the local antecedent for caki. Eleven 4-year-olds allowed both local and long-distance antecedents, and one child at age 4 accepted only the long-distance antecedent. In the "name-quantifier-reflexive" condition, nine 4-year-olds accepted only the local antecedent, and four 4-year-olds accepted both local and long-distance antecedents. Six 4-year-olds accepted only the long-distance antecedent.

The children's responses to the filler sentence were correct 88% of the time.

Discussion

The results of this experiment suggest that the Subset Principle as a learning principle operates in Korean children's acquisition of long-distance reflexives. Korean-speaking children passed through a developmental stage in which they preferred the local antecedent for the long-distance reflexive caki. The fact that about half of the children at age 4 allowed only a local antecedent as an antecedent for caki indicates that they must have assumed the most retrictive value of the Governing Category Parameter (GCP). On the basis of positive evidence in the input data, Korean children eventually reset the GCP to the appropriate L1 value. The children older than 6 demonstrated their having the right value of the GCP by exhibiting adultlike response pattern, that is, by showing the preference for the long-distance antecedent over the local antecedent for caki.

Hyams and Sigurjónsdóttir (1990) presented the experimental data indicating that Icelandic children consistently preferred the long-distance antecedent over the local antecedent for sig 'self', which, they argue, runs counter to the developmental interpretation of the Subset Principle. The verb used in their experiment was gefa 'give', which imposes a strong preference for a long-distance antecedent. Given this, Hyams and Sigurjónsdóttir's data can not be taken as evidence of the nonoperation of the Subset Principle. Icelandic children's preference for the long-distance antecedent for sig might be due either to the nonoperation of the Subset Principle or to the lexical property of the verb[17].

---

[17] According to Hyams and Sigurjósdótir (1990), no verbs are completely neutral with respect to the local/long-distance antecedent effect in Icelandic. If a local verb such as raka

Chomsky (1986a) argues that anaphors undergo LF-movement to INFL position leaving a trace. Under this assumption, the long-distance anaphor is considered as actually bound in a local domain. Thus, the linguistic variation observed across languages is reduced entirely to the respective lexical properties of the different reflexives and is not the result of the setting of different values of a parameter (Pica, 1991, p.122). Within LF-movement to INFL theory, children's language learning task becomes easier since they need not determine what the appropriate binding domain is for each lexical item. If children's learning task is reduced to simply learning the lexical properties associated with particular reflexives, and long-distance binding is a lexical property of reflexives such as Korean caki, we may argue that Korean children's initial preference for the local-antecedent is due to their incomplete learning of the reflexive caki.

Chien and Wexler (1990, 1991) suggest that children know Binding Principle B but do not know a relevant pragmatic principle. This hypothesis predicts that children will perform better on bound variable pronouns than on referential pronouns because the Binding Theory constrains bound variables but not referential pronouns. Referential pronouns are subject to a

---

'to shave' had been used in their experiment, and the children had preferred a local antecedent, the preference might have been due to the Subset Principle effect, or to the lexical property of the verb. Therefore, in Icelandic children's experiments, an experimental bias cannot be avoided in any case.

pragmatic principle. Under this assumption, it is predicted that children will show no performance difference between bound variable anaphors and referential anaphors because both bound variable and referential anaphors are subject to the Binding Theory. Grimshaw and Rosen (1990) opposed this hypothesis, claiming that bound variable interpretations may not always be available to children. According to Grimshaw and Rosen, when children fail to construct bound varible readings, they tend to reject sentence-meaning pairs. Since "no" responses are correct for pronouns and incorrect for anaphors, it is predicted that performance on bound variable pronouns will be higher than performance on referential pronouns, and performance on bound variable anaphors will be lower than performance on referential anaphors. The results of the present experiment support Grimshaw and Rosen's claim. The children at age 4 showed better performance on the local referential antecedent than on the local bound variable antecedent. This finding suggests that some 4 year old Korean children might have problems in interpreting the reflexive caki as a bound variable. With respect to this issue, Lee (1990) reported no performance difference between referential and quantified antecedents, which supports Chien and Wexler (1990). However, if we carefully analyze her data, performance differences between two antecedent types emerge. For example, Lee's youngest subjects (5;1) accepted the long-distance antecedent about 60% of the time in the referential-quantifier sentences, while they accepted the long-distance antecedent about 40% of the time in the quantifier-name sentence. That is, the children at age 5;1 showed lower performance on the quantified antecedent relative to the referential antecedent in terms of long-distance binding. The performance difference in the predicted direction is also observed with respect to local binding.

CHAPTER 5
SECOND LANGUAGE ACQUISITION OF ENGLISH REFLEXIVES BY NATIVE SPEAKERS OF KOREAN

Rationale

In Chapter 1, we saw that one of the central issues in second language acquisition research concerned the question of whether UG is still accessible to the adult L2 learner. While researchers such as White (1988) and Flynn (1987) maintain that principles and parameters of UG are available to adult L2 learners, others (Bley-Vroman, 1989; Schachter, 1988; Clahsen and Muysken, 1986) argue that this is not the case.

In order to determine which position is indeed correct, we need to investigate whether or not L2 learners have linguistic knowledge for which there is no evidence in the input data. If L2 learners attain any type of knowledge which is attributable to UG, then we have good reason to believe that UG operates in adult L2 acquisition. However, if both the L1 and the L2 show the operation of a particular principle of UG, or if the L1 and the L2 have the same value for a particular parameter, although L2 learners demonstrate knowledge of the relevant properties of the L2, there is no way of knowing whether this knowledge is attributed to the availability of UG or to transfer of L1 knowledge. Therefore, to provide strong evidence for the operation of UG in adult L2 acquisition, it is necessary to eliminate effects of the L1. White (1990) suggests the following two situations where the effects of the L1 can be eliminated (p.128):

(1) a. some principle operates in the L2 but not the L1, and
    b. the input underdetermines the L2 grammar.

(2) a. the L1 and the L2 have different values for some parameter, and
    b. the input underdetermines the L2 grammar.

(1) is concerned with the operation of principles of UG. If L2 learners demonstrate knowledge of a principle of UG which is not instantiated in their L1, this will provide support for the claim that UG is still accessible to adult L2 learners. (2) is relevant to the parameters of UG. If L2 learners, under situation (2), acquire the proper L2 value of a parameter, this will also be evidence for the operation of UG in adult L2 acquisition.

Second language acquisition of English reflexives by native speakers of Korean meets the conditions in (2). English and Korean differ in the domain in which reflexives may be bound and it is unlikely that the binding domain of English reflexives is explicitly taught in the classroom. In addition, the fact that English is a subset of Korean with respect to reflexive binding provides an opportunity to investigate whether the Subset Principle argued to operate in L1 acquisition also operates in L2 acquisition.

This chapter reports on an experimental study conducted to investigate how native speakers of Korean at various levels of English proficiency interpret English reflexives. The Governing Category Parameter and the Proper Antecedent Parameter of Wexler and Manzini (1987) are studied in relation to the Subset Principle. The issue of whether UG is still available to adult second language learners is discussed on the basis of results of the experiment.

The Experimental Hypotheses

The research hypotheses can be stated as follows:

The Governing Category Parameter

H1: second language acquisition follows the course of first language acquisition. The Subset Principle operates in L2 acquisition, so Korean learners of English will adopt the subset L2 value immediately.

H2: the Subset Principle does not operate in L2 acquisition and the superset L1 value is transferred to the L2. Therefore, Korean learners of English will incorrectly allow long-distance antecedents.

H3: the Subset Principle does not operate and the L1 value is not transferred to the L2 either. Instead, an intermediate value is adopted as suggested by Finer and Broselow (1986). Then, the prediction is that learners will disallow the long-distance antecedent in tensed clauses but allow it in infinitival clauses.

H4: an unnatural possibility which violates UG is adopted. Learners may disallow the long-distance antecedent in infinitival clauses but allow it in tensed clauses.

The Proper Antecedent Parameter

H1: the Subset Principle operates or L1 transfer occurs,[1] so learners will start out with the unmarked value of the PAP, allowing only subjects as the antecedents of reflexives.

H2: Korean learners will immediately notice from the positive data from English that English has the marked value of the PAP. Therefore, learners will allow nonsubjects as well as subjects as the antecedents of reflexives.

H3: an unnatural grammar which violates UG will emerge. Learners may allow only nonsubjects as the antecedents of reflexives.

---

[1] Since Korean represents the subset value of the PAP, L1 transfer results in the same effect as the operation of the Subset Principle. In the cases like this, there is no way of knowing whether learners' behavior is attributed to the operation of the Subset Principle or to L1 transfer.

The Experiment

Method

Subjects. The subjects tested in this experiment were 60 native speakers of Korean learning English, with 15 subjects in each group. An English control group consisted of 15 native speakers of English attending the University of Florida. Korean controls were 15 students who attended a college in Seoul, Korea. Background summary for each experimental group is as follows.[2]

1) Group 1 (n=15): this group comprised 9 female and 6 male grade 9 students aged 14 to 15. These subjects had studied English for 2 and half years at the time the test was administered. They received English lessons 4 times a week from nonnative instructors.

2) Group 2 (n=15): this group consisted of 7 female and 8 male grade 11 students aged from 16 to 17. These subjects had studied English for 4 and half years at the time of testing. They had English class 5 times a week from nonnative instructors. The Grammar-Translation Method was used for the purpose of helping students to prepare for the college

---

[2] Those who had been exposed to English before age 12, or those who had lived abroad before age 23 were not included in the experimental groups. Those who had had experience in linguistics were also excluded. Before administering the test, it was ascertained that none of the subjects had been explicitly taught the behavior of English reflexives.

entrance examination.

3) Group 3 (n=15): this group consisted of 8 female and 7 male first-year college students aged from 18 to 19. These subjects had studied English for 6 and half years at the time of testing. They had English class 5 times a week from nonnative instructors. Three of 5 lessons were focused on reading comprehension and the other 2 lessons were focused on listening comprehension. Six in this group of the subjects had experience with native instructors through private institutes.

4) Group 4 (n=15): this group consisted of 4 female and 11 male students who had studied in the USA for at least 3 years. All of them were graduate students at the University of Florida. Their ages ranged from 27 to 33. All these 15 had taken TOEFL before first coming to the USA and scored above 550. Some of them had taken conversation courses at the University of Florida but none of them had been in the English Language Institute for intensive training.

Materials. Before the actual test, a pretest was given to students. The pretest was designed to test whether students knew the structures and vocabulary which would be used in the actual test. Students' knowledge of reflexive binding, i.e., the fact that reflexives cannot take extra-sentential antecedents, were also tested. (The pretest is given in Appendix D.) Only the students who had correctly answered all the items of the pretest were included in the experimental groups. Of the high school students pretested, two-thirds of the grade 9 students and a half of the grade 11 students failed. Of the college students pretested, only 3 failed, and none in group 4 failed in the pretest.

In the actual test, four different types of sentences were included, with 4 sentences of each type. Thus, a total 16 sentences were tested. The following presents the types of sentences used in the study[3]:

1) Type A: two-clause sentences containing tensed embedded clauses
   a. John thinks that Tom likes himself.
   b. Susan does not believe that Mary hurt herself.
   c. John said that Tom washed himself.
   d. Susan knows that Mary does not respect herself.
2) Type B: two-clause sentences containing infinitival embedded clauses
   a. John wants Tom to wash himself.
   b. Susan told Mary to respect herself.
   c. John asked Tom not to hurt himself.
   d. Susan told Mary not to hate herself.
3) Type C: one-clause sentences
   a. John told Tom about himself.

---

[3] English reflexives are first taught in the classroom in grade 8. Since Grade 9 students do not have a large vocabulary in English, the test sentences were designed to include only the words which had been introduced in English class. In the same vein, structures as simple as possible were used in the test. In order to avoid monotony, negative sentences as well as affirmative sentences were included, as in Hirakawa (1990).

b. Susan talked to Mary about herself.
c. John gave Tom a picture of himself.
d. Susan asked Mary about herself.

4) Type D: three-clause sentences containing infinitival embedded clauses
a. John thinks that Tom wants Bill to wash himself.
b. Susan believes that Mary told Alice not to hurt herself.
c. John says that Tom told Bill not to hate himself.
d. Susan knows that Mary wants Alice to respect herself.

Types A and B sentences are relevant to the investigation of the GCP. Since the previous studies (Finer and Broselow, 1986; Hirakawa, 1990) found that reflexives in infinitival clauses had received more non-local responses than reflexives in tensed clauses, two types of sentence (A and B) were included for the purpose of comparison. Type C sentences were included to investigate the PAP. Type D sentences aimed to examine the GCP further. Finer and Broselow (1986) argued that their subjects were assuming an intermediate value of the GCP, distinguishing between tensed and infinitival clauses. If this was indeed the case, Korean learners should not choose the subjects of matrix clauses as the antecedents of reflexives in sentences like Type D, as suggested by Hirakawa (1990).

A Korean-speaking control group received a Korean version of the test. Each test sentence was translated into Korean as naturally as possible.[4]

Procedures. The test sentences were randomized and presented in the same order. The test was administered either individually or to a class. Before administering the test, it was determined that all the subjects knew that John, Tom and Bill were male names and Susan, Mary and Alice were female names. The subjects were informed that there was no time limit. However, they were instructed to answer each item based on how they felt about each sentence, without thinking too much. They were also instructed not to change their answers once they were done. Both written and oral instructions were given in Korean. (For English controls, those instructions were given in English.) The subjects were asked to indicate the antecedent of the reflexive by circling one of the given choices. Consider the following examples:

(3) John thinks that Tom likes himself.
    a. John
    b. Tom
    c. either John or Tom
    d. I don't know

(4) John thinks that Tom wants Bill to wash himself.
    a. John

---

[4] 15 Korean-speaking adults who achieved an advanced level of proficiency in English were asked to translate the test sentences into Korean. The most common interpretation for each sentence was adopted to be used for Korean controls.

b. Tom
c. Bill
d. either John or Tom
e. either Tom or Bill
f. either John or Bill
g. either John or Tom or Bill
h. I don't know

In (3), the (a) and (b) answer choices refer to the potential antecedent appearing first and second in the sentence, that is, NP1 (John) and NP2 (Tom), respectively. The third answer, either NP1 and NP2, refers to the ambiguous interpretation of the sentence. For the case where the subject could not decide the appropriate antecedent of the reflexive, "I don't know" answer was included as the fourth choice. In (4), in addition to the NP1 (John), NP2 (Tom) and NP3 (Bill), all the possible combinations of these three potential antecedents were given.

Results

Performance of control groups. Table 5 shows overall responses from the English control group and the Korean control group. As expected, the English control group performed nearly perfectly with respect to the GCP. Regarding the PAP, native speakers of English allowed nonsubject as well as subject as antecedents of reflexives, with preference of

Table 5 Responses from the Control Groups

		English (n=15)	Korean (n=15)
Type A	NP1	0 (0.00%)	29 (48.33%)
	NP2	60 (100.00%)	19 (31.67%)
	NP1/2	0 (0.00%)	12 (20.00%)
Type B	NP1	1 (1.67%)	25 (41.67%)
	NP2	59 (98.33%)	18 (30.00%)
	NP1/2	0 (0.00%)	17 (28.33%)
Type C	NP1	41 (68.33%)	55 (91.67%)
	NP2	13 (21.67%)	0 (0.00%)
	NP1/2	6 (10.00%)	5 (8.33%)
Type D	NP1	0 (0.00%)	5 (8.33%)
	NP2	0 (0.00%)	30 (50.00%)
	NP3	60 (100.00%)	14 (23.33%)
	NP1/2	0 (0.00%)	1 (1.67%)
	NP1/3	0 (0.00%)	0 (0.00%)
	NP2/3	0 (0.00%)	9 (15.00%)
	NP1/2/3	0 (0.00%)	1 (1.67%)

subject to nonsubject antecedents, 68% to 22%. This is in contrast with the responses from the Korean control group.

None of the Korean controls chose nonsubject antecedents for reflexives. With respect to the GCP, while native speakers of Korean showed all three types of responses (i.e., "NP1", "NP2", or "either NP1 or NP2") as expected, long-distance antecedents were most preferred.

Overall performance of experimental groups. Table 6 displays the number and the percentage of responses given by four experimental groups to four different types of sentences. Table 6 shows that all groups performed quite well across the four types of sentences. With respect to Types A, B and D sentences, which are of relevance to the investigation of the GCP, the most frequent response was the local interpretation of the reflexives. Korean learners of English as a whole chose the local antecedent more than 65% of the time (66.67%, 72.08%, 67.50% for Types A, B and D, respectively). However, the long-distance antecedent was also chosen more than 20% of time (28.33%, 22.08%, 22.92% for Types A, B and D, respectively), which means that the subjects, all together, had not yet acquired the behavior of English reflexives. (The analysis of individual subjects' responses revealed that this response pattern was consistent across subjects, with the exception of Group 4 subjects. While none of the subjects from Groups 1,2 and 3 responded perfectly to types A, B and D sentences, 7 out of 15 subjects from Group 4 showed 100% correct responses to these sentences.) The "either NP1 or NP2" or "either NP1 or NP2 or NP3" responses were quite rare. The

Table 6 The Number and percentage of responses by experimental groups

		Group 1 Number	(n= 15) %	Group 2 Number	(n= 15) %	Group 3 Number	(n= 15) %	Group 4 Number	(n= 15) %	Total Number	(n= 60) %
Type A	NP1	25	41.67	19	31.67	18	30.00	6	10.00	68	28.33
	NP2	31	51.67	34	56.67	41	68.33	54	90.00	160	66.67
	NP1/2	2	3.33	1	1.67	1	1.67	0	0.00	4	1.67
	Dont' know	2	3.33	6	10.00	0	0.00	0	0.00	8	3.33
	Total	60		60		60		60		240	
Type B	NP1	18	30.00	18	30.00	12	20.00	5	8.33	53	22.08
	NP2	39	65.00	34	56.67	45	75.00	55	91.67	173	72.08
	NP1/2	2	3.33	0	0.00	2	3.33	0	0.00	4	1.67
	Dont' know	1	1.67	8	13.33	1	1.67	0	0.00	10	4.17
	Total	60		60		60		60		240	
Type C	NP1	48	80.00	43	71.67	49	81.67	54	90.00	194	80.83
	NP2	9	15.00	9	15.00	8	13.33	5	8.33	31	12.92
	NP1/2	2	3.33	1	1.67	2	3.33	1	1.67	6	2.50
	Dont' know	1	1.67	7	11.67	1	1.67	0	0.00	9	3.75
	Total	60		60		60		60		240	
Type D	NP1	4	6.67	1	1.67	4	6.67	0	0.00	9	3.75
	NP2	12	20.00	19	31.67	10	16.67	5	8.33	46	19.17
	NP3	34	56.67	35	58.33	38	63.33	55	91.67	162	67.50
	NP1/2	3	5.00	2	3.33	0	0.00	0	0.00	5	2.08
	NP1/3	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	NP2/3	5	8.33	0	0.00	5	8.33	0	0.00	10	4.17
	NP1/2/3	1	1.67	2	3.33	3	5.00	0	0.00	6	2.50
	Don't know	1	1.67	1	1.67	0	0.00	0	0.00	2	0.83
	Total	60		60		60		60		240	

subjects tended not to judge the sentences to be ambiguous. The fact that the subjects showed nonlocal responses about 35% of the time suggests that the Subset Principle does not operate in L2 acquisition, since the Subset Principle predicts that subjects will only choose local antecedents for the reflexive. With respect to the PAP, the subjects correctly allowed nonsubjects as well as subjects as the antecedents of reflexives. This result indicates that the subjects had already reset the PAP to the marked value.

In order to determine whether there are significant differences in performance across groups and sentence types, an analysis of variance was done. Results of the ANOVA indicated a significant group effect (F(3,56)=14.71, p<.001) but no significant effect of sentence types (F(2,112)=1.29, p=.279) or interaction between groups and sentence types (F(6,112)=.60, p=.729). To refine the analysis, the data were further analyzed. Tukey's procedure revealed that Groups 1, 2 and 3 are significantly different from Group 4 (p<.05). Between Groups 1 and 2, 1 and 3, 2 and 3, no significant difference was found.

Performance of individual subjects. Thomas (1991) and Eckman (1993) argue that in order to determine whether L2 learners' grammars are constrained by UG, individual subjects' patterns of response should be investigated. Therefore, I present the number of subjects within each group who systematically bound reflexives to the indicated antecedent(s). In Table 7, 'systematicity' is defined as 3 or 4 identical responses to the 4 tokens of each sentence type.

Table 7 indicates that as subjects' proficiency level increased, more subjects systematically bound reflexives only to local antecedents. In the case of Type C sentences, most subjects systematically bound reflexives only to subject NPs. The fact that only 1 out of 60 subjects systematically allowed ambiguous interpretations of reflexives (in Type D sentences) suggests that subjects habitually prefer one interpretation over the other(s).

Thomas (1991) and Eckman (1993) suggest that the response pattern which allows long-distance binding while disallowing local binding is not admitted by Wexler and Manzini's GCP. However, if we consider that native-speaker controls as well as L2 learners tend to avoid ambiguous interpretations, some subjects' responses allowing only long-distance binding can be explained as their preference for long-distance antecedents. Since long-distance antecedents are preferred to local antecedents in Korean, some subjects' systematic preference for long-distance binding may be due to L1 interference. The fact that 14 out of 15 subjects from group 4 systematically allowed only local binding, despite the preference for long-distance antecedents in Korean, suggests that these learners had already acquired the behavior of English reflexives.[5]

---

[5] In order to determine whether L2 learners' responses represent their preference for one interpretation over the other(s) or their underlying grammars, a new methodology must

Table 7 The number of subjects within each group who systematically bound reflexives to the indicated antecedent(s)

	G1 (n=15)	G2 (n=15)	G3 (n=15)	G4 (n=15)
Type A				
NP1	1	3	1	0
NP2	4	7	11	14
NP1/2	0	0	0	0
Type B				
NP1	1	1	1	0
NP2	8	4	11	14
NP1/2	0	0	0	0
Type C				
NP1	13	11	13	15
NP2	0	0	0	0
NP1/2	0	0	0	0
Type D				
NP1	0	0	1	0
NP2	0	1	0	0
NP3	7	6	9	14
NP1/2	0	0	0	0
NP1/3	0	0	0	0
NP2/3	0	0	1	0
NP1/2/3	0	0	0	0

---

be used. That is, we need to elicit L2 learners' judgment of different interpretations of the same sentence by presenting the learner with one context and one sentence at a time.

Performance on the governing category parameter. The results from the experimental groups showed that the subjects did not perform differently with respect to the Types A and B. This result was rather unexpected, since the previous studies found a difference in choice of local antecedents between sentences involving tensed embedded clauses and those involving infinitival embedded clauses. The results from Type D sentences confirmed no performance difference between tensed and infinitival clauses. The subjects correctly chose the local antecedent 67% and 68% of the time on Type A sentences and Type D sentences, respectively. Because no significant difference between three types of sentences was obtained, it was decided to take the results from Types A, B and D together. Table 8 displays the mean number and percentage of correct responses from each experimental group. Since a total of 12 sentences related to the GCP were included in the test, a perfect score is 12.

Table 8 Mean number and percentage of correct responses (by Group)

	Group 1	Group 2	Group 3	Group 4
Score	6.93 (57.75%)	6.87 (57.25%)	8.27 (68.92%)	10.93 (91.08%)

Table 8 suggests that number of years of English study has an effect on the subjects' ability to correctly identify the antecedents of reflexives. Figure 64 displays the relationship between performance on the test and years of English study. As Figure 64 indicates, there exists a positive relationship between years of English study and test score, with the exception of Group 2.

However, the fact that Group 4 performed significantly better than Groups 1, 2 and 3 suggests that the performance differences among the four groups might be attributed to the amount of natural linguistic input each group had received. Group 4 had received lots of natural L2 input and had experience using English in communicative situations. In contrast, Groups 1 and 2 had received no English training from native instructors and they had been exposed to English only in formal classroom settings. Most of class time in these two groups were devoted to grammar instruction and translation. Group 3 also had had English training in formal classroom settings, but listening comprehension was an important part of English lessons and some of group 3 subjects had had experience with native instructors (by taking English conversation courses).

In order to determine whether there is a significant difference in performance between Group 4 and the English controp group, an analysis of variance was done. The result showed no significant difference between two groups

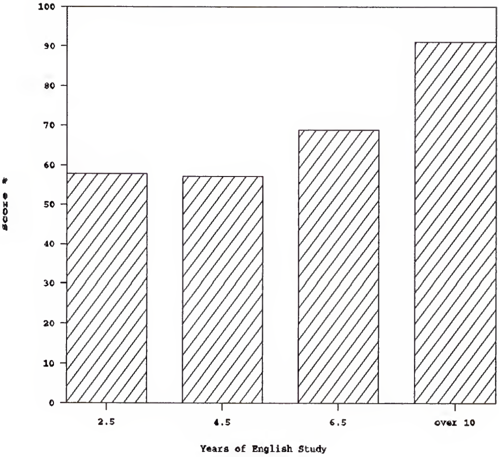


Figure 64 Relationship of score to number of years of English study

(F(1,28)=5.55, p<.05). Mean percentage of correct responses given by Group 4 and the English control group to Types A, B and D sentences is 91.08 and 99.44, respectively.

The proper antecedent parameter. The results from Type C sentences showed that Korean learners had already reset the PAP to its L2 value. Even the youngest group of the experimental groups correctly allowed nonsubjects as well as subjects as the antecedents of reflexives. Since only subjects are allowed to be the antecedents of reflexives in Korean, the subjects could not transfer the L1 value of the PAP to L2. This result raises questions about Finer and Broselow's (1986) interpretation that Korean L2 learners seemed to analyze the subject of the infinitive as the direct object of the matrix verb and to avoid it as the antecedent of the reflexive because of the PAP. According to Finer and Broselow, Korean L2 learners might assume the unmarked value of the PAP because of the operation of the Subset Principle and this might affect learners' performance on Type B sentences. However, the results from Type C sentences shows that Korean learners were not assuming the unmarked value of the PAP.

Although either subjects or nonsubjects are allowed as the antecedents of reflexives, Korean learners preferred subject to nonsubject antecedents (81% to 13%) as did English controls. However, L2 learners' response pattern did not replicate that of English controls. In fact, there was a significant difference between Korean learners and English controls (χ^2=9.916, p<.01). The results for individual sentences revealed that Korean learners and English controls had not responded similarly to some sentences. For example, in the following sentence, where English controls chose the nonsubject antecedent almost exclusively, Korean learners most frequently chose the subject antecedent:

(5) Susan asked Mary about herself.
NP1 NP2

Table 9 The number of responses to (5) by groups

	G1 (n=15)	G2 (n=15)	G3 (n=15)	G4 (n=15)	Control (n=15)
NP1	8	6	10	10	0
NP2	6	6	4	4	13
NP1/2	1	0	0	1	2
Don't know	0	3	1	0	0

Zobl (1989) argued that L2 learners show differential sensitivity to input properties: while L2 learners are sensitive to abstract properties of the L2 syntax, they are not very sensitive to discourse-pragmatic properties of the L2. The results from Type C sentences are consistent with this claim. While Korean learners reset the PAP to its L2 value, they do not seem to have semantic or pragmatic knowledge that native speakers of English have. For example, when Korean learners encounter sentences like (5), most of them, even the most advanced learners, will interpret the reflexive as referring to the subject, which is inconsistent with the interpretation that most native speakers of English assume.

Discussion

The results of this experiment suggest that the Subset Principle does not operate in L2 acquisition. If the Subset Principle were operating, Korean learners of English should consistently choose the local antecedents of reflexives. Since this proved not to be the case, we may conclude that the Subset Principle, a learning principle assumed to operate in L1 acquisition, does not continue to function in L2 acquisition.

The results from Types A and B sentences are inconsistent with those reported by Finer and Broselow (1986) and by Hirakawa (1990). Finer and Broselow found that there were more nonlocal responses for infinitival clauses than for tensed clauses. This finding was replicated by Hirakawa. In order to account for the differential performance on these two types of sentences, Finer and Broselow suggested that L2 learners might adopt an intermediate value of the GCP. Hirakawa also suggested that L2 learners might pass through the stage in which they assume an intermediate value of the GCP. She proposed that learners move from the widest value to the narrower values as they become more proficient in English. This proposal is disconfirmed in this experiment, since the subjects in the present experiment, at all levels of English proficiency, did not perform differently with respect to Type A and B sentences. In order to test the validity of Hirakawa's proposal, further empirical investigation is required.

With respect to the issue of the availability of UG, the results of this experiment are consistent with White (1990)'s claim: although L1 transfer occurs initially, parameter resetting is possible, given appropriate input. The fact that the subjects from Groups 1, 2 and 3 allowed the long-distance antecedents of reflexives over 20% of time suggests that they were transferring the superset L1 value of the GCP into their L2. However, the fact that the Group 4 subjects did not perform differently from the English controls suggest that if enough positive data from the L2 are given, it is possible to change from the superset L1 value to the subset L2 value. The ability to change from the L1 value of a parameter to the L2 value shows that UG must still be operating, since the parameter values are part of UG (White, 1989). Therefore, we can argue that L2 acquisition as well as L1 acquisition is constrained by UG, at least in the domain tested.

Implications of the results of the experiment for L2 Pedagogy

The results of this experiment suggest that natural linguistic input from the L2 may be critical to parameter resetting. The most advanced group of four experimental groups successfully reset the GCP to its L2 value: the learners performed in the same way as the native speakers of English. This group had been in an English-speaking environment for at least three years, using English in communicative situations. In contrast to this group, the other three groups had not received much natural input from native English speakers and had been exposed to English only in classroom settings. Based on these observations, we may argue that a large amount of positive data from the L2 is essential for parameter resetting in the case in which the L1 has the superset value and the L2 has the subset value of a parameter.

In the case of second language acquisition, as in the case of learning English in the USA, the positive data from the L2 will be sufficient for parameter resetting, at least in the case of the GCP. Hyams (1986) argued that during the developmental process of L1, the child's perception of the input data changes: there is some perceptual mechanism that filters out the relevant input data at the early stage, but brings them to the child's attention at some later stage.
As in L1 acquisition, in L2 acquisition the learner's perception of the input data may also change. As the learner's

level of proficiency in English goes up by getting more positive data from English, he or she may come to attend to more subtle aspects of English. The behavior of English reflexives is one such aspect. Thus, it may be that only advanced L2 learners are able to attend to and eventually acquire the properties of Engilsh reflexives, thereby resetting the GCP to its L2 value.

In the case of foreign language acquisition, as in the case of learning English in Korea, it is hard for learners to get enough positive English input, since they are exposed to English only in formal classroom settings. In the situations like this, negative evidence[6] may be useful. In order to inform L2 learners that certain interpretations are impossible in English, several methods can be used. In addition to explicit grammar teaching, Rutherford and Sharwood Smith (1987)'s consciousness-raising (the deliberate attempt to draw the learner's attention specifically to the formal properties of the target language), or Tomasello and Herron (1990)'s garden-path method (the way whereby L2 learners are induced to make errors and then they are given corrections) may be useful. If L2 learners are not informed of the behavior of English reflexives and enough positive input is not given either, L2 learners seem to assume the superset value of the

---

[6] Schwartz (1987) and Schwartz and Gubala-Ryzak (1992) argue that negative evidence cannot be used in L2 acquisition. However, according to Birdsong (1989), negative evidence is necessary and useful for the disconfirmation of certain hypothesis types in L2 acquisition.

GCP and allow nonnativelike interpretations in sentences like Types A, B and D.

CHAPTER 6
SUMMARY AND CONCLUSIONS

This dissertation has investigated (1) Korean-speaking children's acquisition of binding and (2) Korean adult learners' second language acquisition of English reflexive binding. The major results of the experiments are summarized as follows:

1. The results from the experiments for Principles A, B and C showed that Principle B was not necessary less available to children early in their grammatical development than Principle A. Children performed very well on the reflexive _caki_. However, with respect to another type of reflexive _cakicasin_ and the reciprocal _selo_, they showed poor performance. The children also showed problems with Principles B and C. A steady increase in performance from younger to older children was found in all three experiments. These findings strongly support the Lexical Learning Hypothesis (Wexler and Manzini, 1987).

2. The results from the experiment on the acquisition of the long-distance anaphor _caki_ in Korean revealed that Korean-speaking children passed through a developmental stage in which they preferred the local antecedent over the long-distance one, which suggests that the Subset Principle

operates in L1 acquisition of Korean.

3. The results from the experiment on Korean adult learners' second language acquisition of English reflexives showed that Korean learners of English chose the nonlocal antecedent about 35% of the time, which suggests that they did not start out with the most unmarked value of the Governing Category Parameter. However, advanced learners showed no performance difference from native speakers of English. With respect to the Proper Antecedent Parameter, the subjects correctly allowed nonsubjects as well as subjects as the antecedents of reflexives.

The results presented above suggest that both first and second language acquisition are constrained by Universal Grammar (UG). Since it is apparent that there is no direct evidence of the binding principles in the child's linguistic environment, Korean children's knowledge of binding should be attributed to UG: the set of binding constraints is part of UG and innately supplied to the child. With respect to second language acquisition, the experimental results support the claim that although L1 transfer occurs initially, parameter resetting to the L2 value is possible and hence UG is still accessible to adult L2 learners.

The finding that second language acquisition also involves the language learning faculty which characterizes first language acquisition supports the modular view of the mind: there is a distinct language learning faculty which has properties of its own and which interacts with other systems of knowledge.

Wexler and Manzini (1987) proposed the Subset Principle as one of the learning principles which is independent of but interacts with principles and parameters of UG. Concerning the issue of whether the Subset Principle operates in L1 and L2 acquisition, the results of the experiments suggest that the Subset Principle operates in first language acquisition but not in second language acquisition.

One of the important issues in language acquisition research is methodological. It has been suggested that subjects' performance can reflect their underlying grammatical knowledge only indirectly since performance is affected by factors other than the grammar. Obviously, a variety of cognitive systems interact with the system of grammatical knowledge, affecting subjects' performance. Factors such as knowledge of the world and task demands can also influence subjects' responses. This is particularly true for child subjects. Therefore, language acquisition researchers must be cautious in interpreting experimental results. The development of experimental tasks which can reflect subjects' grammatical knowledge as directly as possible should be one of the goals pursued in future language acquisition research.

APPENDIX A
PRETEST SENTENCES (I)

1. thokki-nun chayk-ul ilk-koissumni-ta.
   rabbit-TOP book-ACC read-ING-DEC
   'The rabbit is reading a book.' (False)
2. i salam-un Yenglani-i-ko i salam-un Sena-ipni-ta.
   this person-TOP Yenglan-be-COMP this person-TOP Sena-be-DEC
   Sena-nun Yenglani-lul kuli-koissumni-ta.
   Sena-TOP Yenglan-ACC paint-ING-DEC
   'This is Yenglan and this is Sena. Sena is painting Yenglan.' (True)
3. thokki-nun kom-i ppalkan paci-lul ipkoiss-ta-ko
   rabbit-TOP bear-NOM red pants-ACC wear-DEC-COMP
   malhayssumni-ta.
   said-DEC
   'The rabbit said that the bear wore red pants.' (False)

APPENDIX B
PRETEST SENTENCES (II)

1. ikes-un thokki-i-ko ikes-un kom-ipni-ta. thokki-nun

   this-TOP rabbit-be-COMP this-TOP bear-be-DEC rabbit-TOP

   caki-lul kuli-koissumni-ta.

   self-ACC paint-ING-DEC

   'This is a rabbit and this is a bear. The rabbit is painting himself. (False)

2. motun thokki-ka wul-koissumni-ta.

   all rabbit-NOM cry-ING-DEC

   'All the rabbits are crying.' (False)

3. thokki-nun kom-i nolay-lul ha-koiss-ta-ko malhayssumni-

   rabbit-TOP bear-NOM song-ACC do-ING-DEC-COMP said-

   ta.

   DEC

   'The rabbit said that the bear was singing a song.' (False)

APPENDIX C
FILLER SENTENCES

Principle A

1. thokki-nun kom-eykey sakwa-lul cwuessumni-ta.

   rabbit-TOP bear-DAT apple-ACC gave-DEC

   'The rabbit gave an apple to the bear.' (True)

2. kom-un thokki-lul ttaylyessumni-ta.

   bear-TOP rabbit-ACC hit-DEC

   'The bear hit the rabbit.' (False)

3. thokki-nun holangi-ka wul-koiss-ta-ko malhayssumni-ta.

   rabbit-TOP tiger-NOM cry-ING-DEC-COMP said-DEC

   'The rabbit said that the tiger was crying.' (False)

Principle B

1. kom-i cam-ul ca-koissul-ttay thokki-nun chayk-ul

   bear-NOM sleep-ING-when rabbit-TOP book-ACC

   ilkessumni-ta.

   read-DEC

   'While the bear was sleeping, the rabbit read a book.' (False)

2. i salam-un Incheli-i-ko i salam-un Dongswu-

   this person-TOP Inchel-be-COMP this person-TOP Dongswu-

   ipni-ta. Incheli-nun Dongswu-ka chayk-ul ilk-koiss-ta-ko

be-DEC Inchel-TOP Dongswu-NOM book-ACC read-ING-DEC-COMP
malhayssumni-ta.
said-DEC
'This is Inchel and this is Dongswu. Inchel said that Dongswu was reading a book.' (True)

3. thokki-ka nolayhal-ttay kom-un paiolin-ul khyessumni-ta.
rabbit-NOM sing-when bear-TOP violin-ACC played-DEC
'When the rabbit sang, the bear played the violin.' (True)

Principle C

1. i salam-un Incheli-i-ko i salam-un Dongswu-
this person-TOP Inchel-be-COMP this person-TOP Dongswu-
ipni-ta. Incheli-ka kongpwuhanun-dongan Dongswu-nun
be-DEC Inchel-NOM study-while Dongswu-TOP
cacenke-lul thassumni-ta.
bicycle-ACC rode-DEC
'This is Inchel and this is Dongswu. While Inchel was studying, Dongswu rode a bicycle.' (True)

2. i salam-un Incheli-i-ko i salam-un Dongswu-
this person-TOP Inchel-be-COMP this person-TOP Dongswu-
ipni-ta. Incheli-wa Dongswu-nun chayk-ul ilk-koissumni-ta.
be-DEC Inchel-and Dongswu-TOP book-ACC read-ING-DEC
'This is Inchel and this is Dongswu. Inchel and Dongswu were reading a book.' (True)

3. i salam-un Incheli-i-ko i salam-un Dongswu-
this person-TOP Inchel-be-COMP this person-TOP Dongswu-

ipni-ta. Incheli-nun Dongswu-ka koyangi-lul kalikhyess-ta-
be-DEC Inchel-TOP Dongswu-NOM cat-ACC pointed at-DEC-
ko sayngkakhassumni-ta.
COMP thought-DEC
'This is Inchel and this is Dongswu. Inchel thought that Dongswu pointed at the cat.' (False)

The Long-distance Anaphor

1. thokki-nun kom-i holangi-lul kalikyess-ta-ko
rabbit-TOP bear-NOM tiger-ACC pointed at-DEC-COMP
sayngkakhayssumni-ta.
thought-DEC
'The rabbit thought that the bear pointed at the tiger.' (False)

APPENDIX D
PRETEST FOR L2 LEARNERS

I. Vocabulary

hurt	respect	believe
picture	hate	wash

II. Translation

1. John said that Tom played tennis.
2. John told Tom about the movie.
3. Susan told Mary to study English.
4. Susan wants Mary not to go swimming.
5. John thinks that Tom wants Bill to visit Mary.
6. Susan does not like Mary.

III. Reflexive-binding

: In the following sentence who does himself refer to?

John and Tom were under the tree.

Tom was painting himself.

a. John B. Tom c. either John or Tom d. I don't know

REFERENCE LIST

Atkinson, M., 1987, "Mechanisms for Language Acquisition: Parameter-setting, Triggering and Learning", First Language 7: 3-30.

Atkinson, M., 1992, Children's Syntax: An Introduction to Principles and Parameters Theory, Blackwell Publishers, Oxford.

Baker, C. L., 1979, "Syntactic Theory and the Projection Problem", Linguistic Inquiry 10: 533-581.

Baker, C. L. and McCarthy, J. J. (eds), 1981, The Logical Problem of Language Acquisition, MIT Press, Cambridge, Mass.

Battistella, E., 1989, "Chinese Reflexivization: A Movement to INFL Approach", Linguistics 27: 987-1012.

Berwick, R. C., 1986, The Acquisition of Syntactic Knowledge, MIT Press, Cambridge, Mass.

Birdsong, D., 1989, Metalinguistic Performance and Interlinguistic Competence, Springer, New York.

Bley-Vroman, R., 1989, "What is the Logical Problem of Foreign Language Learning?", In S. Gass and J. Schachter (eds), Linguistic Pespectives on Second Language Acquisition, Cambridge University Press, Cambridge.

Bley-Vroman, R., Felix, S. and Ioup, G., 1988, "The Accessibility of Universal Grammar in Adult Language Learning", Second Language Research 4: 1-32.

Borer, H., 1984. Parametric Syntax, Foris Publications, Dordrecht.

Borer, H. and Wexler, K., 1987, "The Maturation of Syntax", In T. Roeper and E. Williams (eds), Parameter Setting, Reidel Publishing Company, Dordrecht.

Bouchard, D., 1985, "The Binding Theory and the Notion of Accessible SUBJECT", Linguistic Inquiry 16: 117-133.

Brown, R. and Hanlon, C., 1970, "Derivational Complexity and Order of Acquisition in Child Speech", In J. R. Hayes (ed.), Cognition and the Development of Language, Wiley, New York.

Chien, Y.-C. and Wexler, K., 1987, "Children's Acquisition of the Locality Condition for Reflexives and Pronouns", Papers and Reports on Child Language Development 26: 30-39.

Chien, Y.-C. and Wexler, K., 1990, "Children's Knowledge of Locality Conditions in Binding as Evidence for the Modularity of Syntax and Pragmatics", Language Acquisition 1: 225-295.

Chien, Y.-C. and Wexler, K., 1991, "Children's Knowledge of Pronouns as Bound-Variables in a Long-distance Context", Papers and Reports on Child Language Development 30: 25-38.

Chomsky, N., 1957, Syntactic Structures, Mouton Publishers, The Hague.

Chomsky, N., 1965, Aspects of the Theory of Syntax, MIT Press, Cambridge, Mass.

Chomsky, N., 1973, "Conditions on Transformation", In S. Anderson and P. Kiparsky (eds), A Festschrift for Morris Halle, Holt, Rinehart and Winston, New York.

Chomsky, N., 1980, "On Binding", Linguistic Inquiry 11: 1-46.

Chomsky, N., 1981, Lectures on Government and Binding, Foris Publications, Dordrecht.

Chomsky, N., 1982, Some Concepts and Consequences of the Theory of Government and Binding, Linguistic Inquiry Monograph 6, MIT Press, Cambridge, Mass.

Chomsky, N., 1986a, Knowledge of Language: Its Nature, Origin and Use, Praeger Publishers, New York.

Chomsky, N., 1986b, Barriers, MIT Press, Cambridge, Mass.

Chomsky, N., 1987, "On the Nature, Use and Acquisition of Language: Kyoto, I", Kyoto Lecture, ms.

Chomsky, N., 1988, Language and Problems of Knowledge: The Managua Lectures, MIT Press, Cambridge, Mass.

Clahsen, H., 1992, "Learnability Theory and the Problem of Development", In J. Weissenborn, J. Goodluck and T.

Roeper (eds), Theoretical Issues in Language Acquisition, Lawrence Erlbaum Associates Publishers, Hillsdale.

Clahsen, H. and Muysken, P., 1986, "The Availability of Universal Grammar to Adult and Child Learners: A Study of the Acquisition of German Word Order", Second Language Research 2: 93-119.

Clahsen, H. and Muysken, P., 1989, "The UG Paradox in L2 Acquisition", Second Language Research 5: 1-29.

Cole, P., Hermon, G. and Sung, L.-M., 1990, "Principles and Parameters of Long-Distance Reflexives", Linguistic Inquiry 21: 1-22.

Cook, V., 1988, Chomsky's Universal Grammar: An Introduction, Blackwell Publishers, London.

Crain, S. and McKee, C., 1985, "Acquisition of Structural Restrictions on Anaphora", NELS 16: 94-110.

Deutsch, W., Koster, C. and Koster, J., 1986, "What Can We Learn from Children's Errors in Understanding Anaphora?", Linguistics 24: 203-225.

Eckman, F., 1993, "Local and Long-Distance Anaphora in Second Language Acquisition", Paper presented at the annual meeting of the American Association for Applied Linguistics, Atlanta, April 1993.

Felix, S., 1985, "More Evidence on Competing Cognitive Systems", Second Language Reaearch 1: 47-72.

Felix, S., 1987, Cognition and Language Growth, Foris Publications, Dordrecht.

Finer, D. and Broselow, E., 1986, "Second Language Acquisition of Reflexive-Binding", NELS 16: 154-168.

Flynn, S., 1987, A Parameter-Setting Model of L2 Acquisition, Reidel Publishing Company, Dordrecht.

Frazier, L. and de Villiers, J. (eds), 1990, Language Acquisition and Language Processing, Kluwer Academic Publishers, Dordrecht.

Freidin, R. (ed.), 1991, Principles and Parameters in Comparative Grammar, MIT Press: Cambridge, Mass.

Gass, S. and Schachter, J. (eds), 1989, Linguistic Perspective in Second Languge Acquisition, Cambridge University Press, Cambridge.

Gold, E. M., 1967, "Language Identification in the Input", Information and Control 16: 447-474.

Goodluck, H., 1990, "Knowledge Integration in Processing and Acquisition: Comments on Grimshaw and Rosen", In L. Frazier and J. de Villiers (eds), Language Processing and Language Acquisition, Kluwer Academic Publishers, Dordrecht.

Grimshaw, J. and Rosen, S. T., 1990, "Knowledge and Obedience: The Developmental Status of the Binding Theory", Linguistic Inquiry 21: 187-222.

Haegeman, L., 1991, Introduction to Government and Binding Theory, Blackwell Publishers, Oxford.

Hirakawa, M., 1990, "A Study of the L2 Acquisition of English Reflexives", Second Language Research 6: 60-85.

Hong, S.-S., 1985, A and A' Binding in Korean and English: Government and Binding Parameter, Ph. D. Dissertation, University of Connecticut, Storrs.

Hornstein, N. and Lightfoot, D. (eds), 1981, Explanation in Linguistics: The Logical Problem of Language Acquisition, Longman Inc., London.

Horrocks, J., 1987, Generative Grammar, Longman, London.

Hsu, J. R., Cairns, H. S., Eisenberg, S. and Schlisselberg, G., 1989, "Control and Coreference in Early Child Language", Journal of Child Language 16: 599-622.

Huang, C.-T., 1983, "A Note on the Binding Theory", Linguistic Inquiry 14: 554-561.

Huang, C.-T. and Tang, C.-C., 1991, "The Local Nature of the Long-Distance Reflexive in Chinese", In J. Koster and E. Reuland (eds), Long-Distance Anaphora, Cambridge University Press, Cambridge.

Hyams, N., 1986, Language Acquisition and the Theory of Parameters, Reidel Publishing Company, Dordrecht.

Hyams, N. and Sigurjónsdóttir, S., 1990, "The Development of Long-Distance Anaphora: A Cross-Linguistic Comparison With Special Reference to Icelandic", Language Acquisition 1: 57-93.

Jakubowicz, C., 1984, "On Markedness and Binding Principles", NELS 14: 154-182.

Kang, M.-Y., 1990, "On Reflexive", Studies in Generative Grammar, No. 1, Seoul, Korea.

Kang, S.-H., 1990, Discourse Conditions and Korean Anaphora, Ph. D. Dissertation, University of Florida, Gainesville.

Kaufman, D., 1988, Grammatical and Cognitive Interactions in the Study of Children's Knowledge of Binding Theory and Reference Relations, Ph. D. Dissertation, Temple University, Philadelphia.

Kim, H.-R., 1993, "L2 Acquisition of English Reflexives by Native Speakers of Korean", Paper presented at the Conference on Second Language Acquisition and Pedagogy, University of Wisconsin-Milwaukee, October 1993.

Koster, J., 1984, "On Binding and Control", Linguistic Inquiry 15: 417-459.

Lasnik, H., 1989, Essays on Anaphora, Kluwer Academic Publishers, Dordrecht.

Lasnik, H. and Saito, M., 1984, "On the Nature of Proper Government", Linguistic Inquiry 15: 235-289.

Lebeaux, D., 1983, "A Distributional Difference between Reciprocals and Reflexives", Linguistic Inquiry 14: 723-730.

Lee, H.-J., 1990, Logical Relations in the Child's Grammar: Relative Scope, Bound Variables, and Long-Distance Binding in Korean, Ph. D. Dissertation, University of California-Irvine.

Lee, H.-R., 1992, Local Binding Nature of Korean Reflexives, M. A. Thesis, University of Florida, Gainesville.

Lust, B. (ed.), 1987, Studies in the Acquisition of Anaphora, Vols. I and II. Reidel Publishing Company, Dordrecht.

MacWhinney, B. (ed.), 1987, Mechanisms of Language Acquisition, Lawrence Erlbaum Associates, Hillsdale.

Manzini, M. R. and Wexler, K., 1987, "Parameters, Binding Theory and Learnability", Linguistic Inquiry 18: 413-444.

McDaniel, D., Cairns, H. S. and Hsu, J. R., 1990, "Binding Principles in the Grammars of Young Children", Language Acquisition 1: 121-138.

McKee, C., 1988, Italian Children's Mastery of Binding, Ph. D. Dissertation, University of Connecticut, Storrs.

McKee, C., 1992, "A Comparison of Pronouns and Anaphors in Italian and English Acquisition", Language Acquisition 2: 21-54.

Montalbetti, M. and Wexler, K., 1985, "Binding is Linking", Proceedings of West Coast Conference on Formal Linguistics 4: 228-245.

Pica, P., 1987, "On the Nature of the Reflexivization Cycle", NELS 17: 483-499.

Pinker, S., 1984, Language Learnability and Language Development, Harvard University Press, Cambridge, Mass.

Pinker, S., 1989, Learnability and Cognition, MIT Press, Cambridge.

Reinhart, T., 1976, The Syntactic Domain of Anaphora, Ph. D. Dissertation, MIT.

Roeper, T. and Williams, E. (eds), 1987, Parameter Setting, Reidel Publishing Company, Dordrecht.

Rutherford, W. and Sharwood Smith, M., 1985, "Consciousness-raising and Universal Grammar", Applied Linguistics 6: 274-282.

Schachter, J., 1988, "Second Language Acquisition and its Relationship to Universal Grammar", Applied Linguistics 9: 219-235.

Schwartz, B., 1987, "Ruling out Negative Evidence in Second Language Acquisition", ms., University of Southern California.

Schwartz, B. and Gubala-Ryzak, M., 1992, "Learnability and Grammar Reorganization in L2A: Against Negative Evidence Causing the Unlearning of Verb Movement", Second Language Research 8: 1-38

Solan, L., 1983, On the Acquisition of Pronominal Reference, Reidel Publishing Company, Dordrecht.

Solan, L., 1987, "Parameter Setting and the Development of Pronouns and Reflexives", In T. Roeper and E. Williams (eds), Parameter Setting, Reidel Publishing Company, Dordrecht.

Stevenson, R. and Pickering, M., 1987, "The Effects of Linguistic and Non-linguistic Knowledge on the Acquisition of Pronouns", In P. Griffiths, J. Local and A. Mills (eds), Proceedings of the Child Language

Seminar, York University, England.

Tavakolian, S., 1978, "Children's Comprehension of Pronominal and Missing Subjects in Complicated Sentences", In H. Goodluck and L. Solan (eds), Papers in the Structure and Development of Child Language, University of Massachusetts Occasional Papers in Linguistics 4: 145-152.

Thomas, M., 1989, "The Interpretation of English Reflexive Pronouns by Non-Native Speakers", Studies in Second Language Acquisition 11: 281-301.

Tomasello, M. and Herron, C., 1988, "Down the Garden Path: Inducing and Correcting Overgeneralization Errors in the Foreign Language Classroom", Applied Linguistics 9: 237-246.

Wasow, T., (1986), "Reflections on Anaphora", In B. Lust (ed.), Studies in the Acquisition of Anaphora: Vol. 1., Reidel Publishing Company, Dordrecht.

Weissenborn, J., Goodluck, H. and Roeper, T. (eds), 1992, Theoretical Issues in Language Acquisition: Continuity and Change in Development, Lawrence Erlbaum Associates, Inc., Hillsdale.

Wexler, K. and Chien, Y.-C., 1985, "The Development of Lexical Anaphors and Pronouns", Papers and Reports on Child Language Development 24: 138-149.

Wexler, K. and Culicover, P. W., 1980, Formal Principles of Language Acquisition, MIT Press, Cambridge, Mass.

Wexler, K. and Manzini, R., 1987, "Parameters and Learnability in Binding Theory", In T. Roeper and E. Williams, (eds) Parmeter Setting, Reidel Publishing Company, Dordrecht.

White, L., 1985, "The pro-drop Parameter in Adult Second Language Acquisition", Language Learning 35: 47-62.

White, L., 1988, "Universal Grammar and Language Transfer", In J. Pankhurst, M. Sharwood Smith and P. Van Buren (eds), Learnability and Second Languages: A Book of Readings, Foris Publications, Dordrecht.

White, L., 1989a, "The Principle of Adjacency in Second Language Acquisition: Do L2 Learners Observe the Subset Principle?", In S. Gass and J. Schachter (eds), Linguistic Perspectives on Second Language Acquisition, Cambridge University Press, Cambridge.

White, L., 1989b, Universal Grammar and Second Language Acquisition, John Benjamins Publishing Company, Amsterdam.

White, L., 1990, "Second Language Acquisition and Universal Grammar", Studies in Second Language Acquisition 12: 121-133.

Yang, D.-W., 1983, "The Extended Binding Theory of Anaphora", Language Research 19: 169-192.

Zobl, H., 1988, "Configurationality and the Subset Principle: The Acquisition of V′ by Japanese Learners of English", In J. Pankhurst, M. Sharwood Smith and P. Van Buren (eds), Learnability and Second Languages: A Book of Readings, Foris Publications, Dordrecht.

Zobl, H., 1989, "Modularity in Adult L2 Acquisition", Language Learning 39: 49-79.

BIOGRAPHICAL SKETCH

Hye-Ryun Kim was born on March 9, 1963, in Seoul, Korea. She received a B.A. in English education in 1986, and an M.A. in English linguistics in 1988 from Korea University in Seoul. From March 1988 to December 1988, Ms. Kim worked as a lecturer at the Korea University. Since August 1989, she has been pursuing the degree of Doctor of Philosophy at the University of Florida.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Andrea Tyler

Andrea E. Tyler, Chair
Assistant Professor of
Linguistics

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Enrique Mallén, Cochair
Assistant Professor of Romance
Languages and Literatures

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philisophy.

Norman N. Markel

Norman N. Markel
Professor of Communication
Processes and Disorders

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philisophy.

Ann K. Wehmeyer

Ann K. Wehmeyer
Assistant Professor of
Linguistics

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philisophy.

Michael J.

Michael J. Farrar
Assistant Professor of
Psychology

This dissertation was submitted to the Graduate Faculty of the Department of Linguistics in the College of Liberal Arts and Sciences and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December 1993

Dean, Graduate School